

JPRS 75902

19 June 1980

USSR Report

ECONOMIC AFFAIRS

No. 929

FBIS FOREIGN BROADCAST INFORMATION SERVICE

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INVESTMENT, PRICES, BUDGET AND FINANCE

GREATER EFFECTIVENESS OF CAPITAL INVESTMENT SOUGHT

New Economic Mechanism

Moscow PLANOVOYE KHOZYAYSTVO in Russian No 3, Mar 80 pp 40-49

[Article by V. Krasovskiy, doctor of economics sciences, professor: "New Economic Mechanism and Raising the Effectiveness of Capital Investments"]

[Text] The last three 5-year periods represent an important stage in the establishment of the material-technical foundation of communism. In 1979, the fixed capital of the national economy increased by R 1 trillion, as compared to 1965. This increase is nearly twice the value of the fixed capital produced during all of the previous years of Soviet rule. Capital construction is carried out on an enormous scale. In the course of three 5-year periods, approximately 5,000 large-scale industrial enterprises will be put in operation.

With a view to successful economic development, the CPSU Central Committee--on the initiative of L. I. Brezhnev--mapped out new large-scale measures. A state-wide, scientific energy program is being drawn up; it is planned to increase the capacities of the fuel-energy complex and to improve its structure. In the fields of ferrous and nonferrous metallurgy, there are plans significantly to raise the technical level of production and to increase the output of progressive and economical types of metal products. The machine building industry, which is of crucial importance in the technical re-equipment of the national economy, will undergo rapid development. In the chemical industry, the production of polymeric materials, synthetic fibers and high-grade mineral fertilizer will be expanded. Measures have been outlined for consolidating the technical basis of rail and other types of transport and for improving transport organization.

Through implementation of the complex of measures stipulated by the decree on the improvement of the economic mechanism, which was passed by the CPSU Central Committee and the USSR Council of Ministers, it will be possible to increase the efficiency of production and capital construction and to insure attainment of more significant final economic results.

The intensification of the influence of the economic mechanism has a positive effect on the organization and level of project planning, on material-technical maintenance, on the terms and organization of capital

construction, on the consolidation of the role of the machine building industry in capital construction, on the volume of unfinished construction, on the reduction of the time required for making new capacities operational, and on the quality of construction output.

Under the new conditions of economic operation, the evaluation and economic motivation of the construction organizations' work will be carried out on the basis of the results obtained in the implementation of the plans in regard to the start-up of production capacities and projects, construction commodity production, and increases in labor productivity and profit, i.e. in regard to concrete contributions to the improvement of production efficiency and work quality. The same principle will apply in regard to the buyers and planners, the plants supplying equipment, the enterprises producing building materials and designs, and the transport and supply organizations, where material incentives will be employed only upon fulfillment of the plan regarding the above indicators.

The outdated practice of evaluating the work of contracting organizations by the gross volume of construction-installation operations is being discontinued. In diverse forms, this practice existed for many years and it contributed to the continuous increase in unfinished construction projects, which during the last few years amounted to 85 percent of the annual volume of capital investment. At the same time, there was an increase in the number of projects "in progress" that lay as a dead weight on the shelves of the project planning organizations, while priority construction jobs frequently did not receive the necessary documentation. The same situation obtained in regard to the remnants of uninstalled equipment supplied in "scattered deposits" without regard for start-up schedules, and the incomplete shipment of ferroconcrete articles for which the output targets were determined not by the sequence of operations at the construction sites, but by the gross output volume of the ferroconcrete plants.

The relinquishment of the orientation toward gross value results at each stage of capital construction and the close cooperation among all participants will help to increase the effectiveness of capital investment. It will be necessary to mobilize the enormous resources contained in the unfinished projects; to reduce the materials-intensiveness of construction output, while curtailing the use of heavy and expensive ferroconcrete designs and expanding the use of light, locally procurable materials, and to eliminate unnecessary long-distance transport of building materials. To implement the measures aimed to improve the economic mechanism, it will be necessary to change the technical policy in the construction industry, the structure of the construction capacities and the geographical distribution of the enterprises, and to increase the influence of the mobile construction subdivisions.

The introduction of new methods of economic operation also presupposes changes in the regional and reproduction structure of capital investment. This is bound up with the ever increasing importance of the work concerning

the renovation and technical re-equipment of operating enterprises and with the powerful development of the raw material and fuel plants in the east of the country.

The decree creates favorable conditions for a radical improvement of the estimate and planning work. Of fundamental importance are the instructions concerning the necessity of drawing up the planning estimates by stages. This procedure is based on the experience gained in advanced construction projects and in the Volzhskiy Motor Vehicle Plant in particular.

The time factor was of crucial importance in the construction of the Volzhskiy Motor Vehicle Plant. Construction proceeded at a high rate on account of the application of a new coordinated and stage-based method of planning and construction, the placement of the production facilities in large buildings with standardized frames and pillar height, and the introduction of the latest materials and equipment. The planners' control over the plant construction process and their participation in the technical acceptance of the assembled structures insured a practical solution to many problems and strict observance of the project requirements.

At present, great importance is attributed to the possibility of using the latest technical and scientific developments for the planning of subsequent sections of new projects. Both standard and individual project planning will now be carried out primarily through competitions and selection of the best of the variants submitted.

In project planning, we are abolishing the practice of intermediate payments during the calculations with the clients; payment will be made only for finished plant construction projects and for complexes, sections and projects under construction. Such a procedure is called for to speed up the process of project planning, which presently drags on intolerably. For the financing of expenditures prior to the plan deadlines for project delivery, the planning organizations are given their own working capital; in addition, they receive bank loans. According to the plans, extension of credit will not be broken off upon expiration of the plan deadline, but in such a case more interest will be charged on the loans.

From now on, we will be working out 5-year plans (broken down by year) for project exploration and for the development of the network and material-technical basis of the planning and investigating organizations; these plans will be coordinated with the plans concerning capital construction.

Practical experience has shown the drawbacks of the present procedure of issuing the technical documentation to the builders prior to 1 September of the year preceding the plan year. Consequently, it was decided to include in the plans of capital construction only those construction projects, in regard to which the planning estimates were confirmed on 1 July of the year preceding the plan year, and also the blueprints for the annual work volume.

Under the new conditions of economic operation, the search for the most economical and progressive solutions in project planning is of tremendous importance. The struggle to economize on materials, especially on metals and fuel-energy resources, is becoming a dominant trend. In the fields of capital construction and capital investment, this trend is manifested in the greater regional density of industrial construction in progress, in the compactness and lightness of the buildings, and in the improvement of machinery and of transport routes and other means of communication.

In capital construction, it is necessary to activate the role of machine building--the material foundation of the technical re-equipment of the country's production apparatus, of the renovation and modernization of fixed production capital.

Expenditures on equipment constitute approximately 41 percent of the capital investments in the production sector. If one adds to the cost of the equipment its installation, which is the direct continuation of the process of producing machines and putting them in operation, then the relative share of equipment exceeds 50 percent. In individual sectors of industry, the equipment share of capital investment is even greater. In the instrument building sector, for example, it amounts to 53 percent; in electrical engineering, it is 62 percent, and in various subsectors of the machine building industry, 55 percent. In regard to the supply of equipment, the machine building industry plays a predominant role, even though so-called nonstandardized equipment is produced by the construction and installation organizations.

The complication of technological systems, the rapid change of machine patterns, the complexity of the installation of new equipment--all this substantially enhances the significance of the machine building industry in regard to the establishment and start-up of new enterprises and their manufacturing complexes and automatic lines.

Construction commodity production in the form of operational fixed capital and production capacities can be insured only if the operations of the construction and machine building industries are coordinated. Until recently, the machine building plants confined themselves to the shipment of equipment--usually in "scattered deposits"--including it in the output sold regardless of whether it was put in operation or whether it was lying as a dead weight in the warehouses, becoming physically and conceptually obsolete.

Given the new economic mechanism, the situation is bound to change. For example, the installation work is presently entrusted not only to the specialized organizations of the construction ministries, but also to machine building plants--the suppliers of the equipment. The plants--as the general suppliers in the shipment of complete sets of technical equipment, of manufacturing lines, installations, means of mechanization, automation, regulation and control--will settle accounts for the delivered

and assembled complex of equipment as a whole. Consequently, in the contract relations there is emerging a new party: the general supplier, who can function as a contractor as well.

As early as 1977, the CPSU Central Committee approved the practice of the Ministry of Chemical and Petroleum Machine Building, which in the Ninth 5-Year-Plan began to supply construction projects with complete manufacturing lines, playing the role of a general supplier. The Ministry of Chemical and Petroleum Machine Building supplies the enterprises being built with complete sets of equipment ready for industrial use (including apparatus, mechanisms and instruments produced by other sectors). During the last few years, there have been delivered 260 manufacturing lines, approximately 2,000 installations and over 3,500 complete sets of equipment valued at R 1.3 billion.

Of great interest in this connection is the progressive method of installing ground installations in oil and gas projects in assembly units; during the last few years, this method has been tested in Tyumenskaya Oblast', where the large-scale "Sibkomplektmontazh" [Siberian Assembly-Unit Installation] association has been established for the production of assembly-unit projects and assembly-unit construction. The association is made up of planning offices and plants producing assembly units and mobile installation towers. Assembly-unit installations include finished pumping, compressor, and transfer stations, boiler installations and other structures for oil and petroleum product pipelines, which at the plant are manufactured entirely in assembly units and complete sets (including their equipment) and which subsequently are set up and assembled at the line. The assembly-unit installations produced in this way essentially represent a variety of the output of the machine building industry. According to P. D. Podshivalenko, the Demyansk pumping station for petroleum transfer was established by this method. The station was manufactured in 2 months at a Tyumen' plant; delivery to the place of installation took 8 days, and installation, 3 days.

Delivery of complete sets of equipment and adjustment of this equipment within the period guaranteed must gradually become a binding task for the ministries of machine building and their associations. It is not only the completeness of the equipment delivered which is important; above all, it is necessary to insure skillful installation of the equipment, correction of defects, adjustment and start-up, supply of spare parts and checks of the operation of crucial machinery systems.

We should take into consideration the helpful experience of some foreign machine building firms, whose makeup includes project planning organizations; in addition to project planning, these organizations concern themselves with the delivery of equipment, carry out its installation and start-up testing, and insure supervision, the drawing up of estimates and the accounting of actual expenditures. The contracts concerning delivery of the machines and equipment stipulate "turn-key" jobs, i.e. not only the

construction and delivery of equipment, but also the training of local specialists and the rendering of consulting services in regard to complex problems in connection with new processing methods. As is well known, it is on such terms that the construction organizations of our GKES [State Commission for Economic Cooperation] carry out their construction projects abroad. Japan organizes in this way the construction of steel mills, enterprises for the manufacture of electrical machinery, and mineral fertilizer plants in the developing countries.

The new decree acknowledges as expedient the gradual change-over to a system under which the enterprise or installation is handed over to the buyer in a state of "turn-key" readiness. At present, the payments for "turn-key" jobs still represent an insignificant amount in the volume of paid construction work in the production sector; in residential housing construction, on the other hand, they are predominant. According to the data supplied by P. D. Podshivalenko, the system of delivering "turn-key" jobs makes for great time savings. In 1977, for example, a power complex under construction at the Uglegorsk Hydroelectric Power Station was put in operation in 12 months instead of the 18 months stipulated by the norms.

If in analyzing the effectiveness of capital investment one confines oneself to investments at the expense of accumulation, one omits its important part, which is connected with the utilization of the amortization and repair funds, i.e. the entire process of the maintenance and simple reproduction of the fixed capital and capacities. In 1970, the amortization deductions in the USSR economy totaled R 29.1 billion; in 1978, the deductions amounted to R 63.2 billion, i.e. a 2.2-fold increase. Within the total amortization deductions, the funds allotted to major overhauls increased during the same period from R 14.6 billion to R 26.2 billion, i.e. a 1.8-fold increase.

According to the data for 1978, in industry the funds earmarked for capital repair constituted approximately 30 percent of the total capital investments, and in individual sectors their share was even greater. Thus the Economics Institute of the Central Scientific Research Institute for Ferrous Metallurgy calculated that in the ferrous metallurgy sector these funds constituted 41 percent. The funds allocated for major overhauls represent an essential source of maintaining the capacity of the operating fixed capital; their efficient use represents an important problem.

Ya. B. Kvasha calculated that at the beginning of the 1970's a unit of equipment in physical production was repaired an average of 4 times during its service life--including 3 times in industry--with expenditures on the repeated capital repair amounting to R 460 and R 400, respectively, calculated per R 1,000 of the value of the equipment overhauled. Considering that the average service life of machinery in our industry had been established--according to the data of the equipment inventories--to be 21.5 years and that up to the first restorative repair the machinery was in operation for approximately 6 years, it turned out that for the remaining

16 to 17 years the equipment was maintained in working order only on account of the overhauls, which restored the equipment's capacity, but only within the old technical parameters. It goes without saying that such a system was detrimental to technical progress.

In many cases, the costs for capital repair incurred during the service life of the equipment considerably exceed the equipment's original balance-sheet value. For example, the balance-sheet value of a multiple-unit installation of the Kuybyshev Oil Refining Plant and the capital repair costs during the period of operation amounted to R 1,657,700 and R 4,704,200, respectively. In the case of the AVT-7 unit of the Ufimskiy Oil Refining Plant, the respective figures are R 811,000 and R 1,544,200. In the rubber footwear industry, the average balance-sheet value of a glue mixer equaled R 3,641, and that of rollers and calenders, R 9,988 and R 17,526, respectively, while the repair costs amounted to R 13,923, R 36,392 and R 47,072, respectively, i.e. a 3.8-, 3.6- and 2.7-fold increase. In the petrochemical industry, the cost of new equipment constituted only 1.9 percent of the capital expended on major repairs.

It is now imperative that we shift from the reproduction of capital goods on the old technical basis to the modernization of the available capacities with due regard for technological innovations. In particular, it is necessary rapidly to develop the industrial production of spare parts and gradually to curtail the handicraft spare parts production in small workshops. At the same time, we feel that the capital and capacities available for major overhauls should increasingly be switched over to the modernization and renovation of operating fixed production capital and used for technical retooling. The shift to spare parts production at specialized plants will produce positive results.

In many industrial sectors, modernization coincides with the capital repair of large aggregates and systems. Thus a selective analysis of the results of 415 major overhauls of technical installations in oil refining plants showed that in 221 cases (53 percent) the repair work was accompanied with modernization. The same procedure is followed in ferrous metallurgy--in the modernization or extension of blast and open-hearth furnaces--and in the building materials industry. In the cement industry, approximately 100 kilns used for brick firing were modernized in the last 10 years: Furnace diameters were extended, coolers were exchanged and improved heat exchangers were put in operation.

Since 1962, the statutes currently in force have sanctioned within certain limits the financing of such operations at the expense of the amortization fund, which was designated for capital repairs. The enterprises have been allowed to use this fund for the acquisition of new equipment, if capital repair proved inexpedient.

In the cement industry, the modernization measures, the major overhauls and the intensification of the manufacturing processes served to increase the

productivity of the capacities by 8 million tons of output per year, which is equivalent to the capacity of four large plants. The individual capacity investments in the modernization and re-equipment of the production facilities totaled R 29,000; construction of new facilities requires an investment of R 38,000 to 42,000.

The construction and installation operations involved in major overhauls are synchronous with the modernization and retooling work. These operations resemble modernization and retooling also in regard to the character and conditions of implementation, the organization of material-technical maintenance, etc. Capital repair and modernization are less materials-intensive than new construction. The manual labor input in the operations involved in overhauls is relatively high. Consequently, in the construction and installation organizations engaged in repair and modernization, the volume of operations carried out in accordance with the plan decreases, while wages show an increase. Moreover, there is an increased risk of injury, since many builders are not familiar with work such as is encountered in hot shops or in the crowded conditions of an operating production plant.

All this testifies to the necessity to establish--along with special plan indicators and an incentive system--special organizations for the modernization and overhauling of fixed capital. A highly promising trend in this field is the interplant centralization and specialization of capital repair and modernization. Thus the oil refining industry has established for the purposes mentioned specialized trusts, which in carrying out the operations by contract have considerably increased the volume and improved the quality of the repair work and have reduced equipment down time during the repairs. The share of repair work done by contract has increased in other sectors as well, e.g. in the metallurgical industry, up to 71.2 percent, and in electrical engineering, to 64 percent.

A large reserve for increasing the return on fixed capital is the regular and timely replacement of the production apparatus. Accumulation of obsolete and worn-out producer goods in the industrial sectors interferes with the improvement of economic indicators, diverts large manpower resources and requires excessive expenditures on repairs, which frequently are carried out on a low technical level. According to calculations, for many years only 1 to 2 percent of the fixed capital in service has been replaced each year, which percentage is approximately 2 to 3 times lower than that stipulated by the norm. At the same time, technical re-equipment and renovation of operating enterprises and introduction of new processes sharply increased the yield on capital and reduced input.

In the USSR, a powerful material base has been established for construction. As regards the volume of capital investment and the scale of production of essential building materials and structures, our country has for a long time occupied first place in the world.

Increasingly, however, there are now becoming apparent serious shortcomings in regard to exploitation of the possibilities offered by technological advances in construction. The total volume of building materials and structures exceeds 2.5 billion tons; building materials account for over 25 percent of total rail transport and for over 52 percent of river transport. At the same time, available data indicate that qualitative improvement and a more efficient design of the building materials can reduce their volume by 25 to 30 percent, considerably lower the labor-intensiveness and production costs of the construction sector and shorten its schedules.

The preferential use in construction of heavy structures--especially heavy reinforced concrete which accounts for 35 to 40 percent of the total cost of the materials used--is attributable not so much to economic or technical necessity as to narrow departmental interests. As is well known, precast reinforced concrete is for the most part produced at the enterprises of the contracting construction ministries. The prices of precast reinforced concrete have insured a relatively high enterprise profitability--approximately 20 to 25 percent and more. Until recently, the cost of reinforced concrete was included in the implementation of the plan for construction and installation work, and this in turn encouraged preferential use of this heavy and expensive material. To a large extent, this has impeded the use of in situ ferroconcrete, which is much cheaper and lighter. The single-ply wall panels made of precast ferroconcrete, which are presently used, are much heavier than the single-ply panels produced abroad and they are inferior to the triple-ply panels manufactured in the USSR. The steaming of precast reinforced concrete consumes huge quantities of fuel, whereas for in situ ferroconcrete steam is not always required.

In the principal regions of the concentrated construction sector, over 2,000 plants producing ferroconcrete goods and 420 house-building combines are in operation. The ferroconcrete output volume is greater by far than that of the United States or of all European countries combined. However, many ministries--including the USSR Ministry of Power and Electrification, the USSR Ministry of Heavy Industry Enterprises, the USSR Ministry of Industrial Construction and others--are planning in the long term further to step up construction of plants of this type. The enormous funds allocated for the renovation of enterprises producing reinforced concrete articles will be spent only on improving the planning of the buildings, but concrete input per unit of final output is increasing.

We are concerned about the fact that reinforced concrete is the chief material used in the construction of the oil and gas complex in Tyumenskaya Oblast', where due to the lack of roads, the boggy land and the weak ground foundations it is extremely difficult to use and deliver to the construction site heavy ferroconcrete structures. Lumber--the material traditional for Siberia--is practically not used at all. In Tobol'sk, for example, residential housing is being built with panels delivered from Omsk over thousands of kilometers; at the same time, in clearing the area for the construction projects, no use is being made of timber.

Moreover, panel construction of houses, including that in the European parts of the USSR, entails great heat losses. It was not without reason that the Scientific-Technical Council of the USSR Ministry of Power and Electrification asked the USSR State Committee for Construction Affairs to prohibit the planning and construction of buildings with panel heating installed in outside enclosures.

Of fundamental importance in this connection is the recent decree "On the further development of the industrial production of wooden panel houses and complete sets of wooden components for houses made of local materials for rural residential housing construction," which was passed by the CPSU Central Committee and the USSR Council of Ministers. The USSR Ministry of Light and Wood Processing Industry has been instructed to pursue a unified technical policy in the field of wooden housing construction, to introduce progressive manufacturing processes and to elaborate the requirements in regard to industrial equipment, construction and finishing materials and complementary articles. Utilization of lighter and local materials is necessary not only in the villages, but also in the eastern rayons of the country, in the many new areas with Young Pioneer camp construction, in small towns and in the construction of the many projects on the infrastructure.

The possibilities opened up by technical advances in the construction sector and in the building materials industry are enormous and we must consistently make use of them. Of great value is the experience gained in the construction of the Olympic projects in Moscow, where on account of the use of light enclosures, floors and roofing, it was possible considerably to lighten the building frames, sharply to reduce material input and to shorten the construction time of large-scale projects to 15 to 16 months. It is necessary to use light insulating materials for roofing instead of the heavy and cumbersome clay concrete; triple-ply, insulated wall panels, which are 3 to 4 times as thin as single-ply panels; steel-aggregate granolithic concrete for rapid roofing, and perforated brick for structurally light walls. In our opinion, use of cast-in-situ concrete and ferroconcrete should be expanded from the present 1 percent to 40 to 50 percent of the total volume of concrete work.

Improvement of the organization of capital construction and of its management necessitates not only concentration of the production capacities and reduction of the intermediate units, but also a sharp increase in its mobility.

For the planning institutes, enhancement of mobility means the following: timely preparation of the work organization plans for the construction of new projects; selection of priority complexes; personal supervision of the progress of construction and installation; participation in project planning in the field during the construction of oil and gas pipelines and land-reclamation projects; compilation of lists for the suppliers, specifying the equipment required for the projects; etc. For the machine building

enterprises, enhancement of mobility means: delivery of complete sets of aggregates and machinery systems, supervised installation and subsequently, warranty-covered repair work and supply of spare parts. For the repair plants, it means: not only execution of major overhauls and minor repair and maintenance, but also modernization of the active part of the fixed assets; elimination of conceptually obsolete equipment; etc.

New requirements concerning mobility are arising also in regard to the construction and installation organizations and the enterprises of the building materials industry. For example, use of cast-in-situ concrete in combination with concrete pumps and portable casing reduces in the long term the importance of the stationary ferroconcrete plants and enhances the role of the construction site, which acquires great maneuverability and autonomy; the site is no longer loaded down with heavy ferroconcrete structures and is released from its dependence on external transport. The switch to lightened wooden and light triple-ply, insulated panels promotes introduction of methods of accelerated construction installation and assembly.

In the construction sector, the share of the so-called base-shifting enterprises should increase. According to data supplied by A. B. Nemchinskiy, the specific capital investment in these enterprises is considerably smaller as compared with analogous stationary enterprises of comparable capacity (concrete-mortar enterprises-- $2/3$ to $5/8$; motor transport enterprises-- $5/11$ to $5/14$; enterprises for the technical maintenance and repair of construction machinery-- $5/11$ to $10/29$; asphalt-concrete enterprises-- $2/7$ to $1/4$). As compared with stationary installations, the share of expenditures on equipment is 1.3 to 1.5 times as great, while the transport costs are one-third to one-fourth as high.

However, the principal advantage of such enterprises is the time savings in regard to the preparation of the production basis of construction. According to calculations carried out by A. B. Nemchinskiy, the construction time norm for stationary enterprises is 2 to 2.5 years, while for analogous base-shifting enterprises the norm is 1.2 to 4.8 months. Thus in comparison with the stationary variant, it is possible to reduce to one-fourth to one-sixth the overall production base start-up time and to speed up accordingly the putting in operation of economic projects. Through the use of inventories, it is possible to shorten the time spent on construction site preparation by 2.4 to 6.0 months and--in collaboration with the base-shifting enterprises--to reduce the project construction cycle.

This matter is of great economic significance, since construction has been concentrated primarily in the western regions of the country and is of a stationary character, while for the new large-scale fuel-power and metallurgical complexes in the east such a basis must in many respects be created anew. The lack of base-shifting enterprises causes long delays--sometimes of 5 to 7 years--in the start-up of new projects in Siberia.

Reduction of the time required for making operational new production capacities and fixed assets represents an important problem in connection with the intensification of capital construction. The annual start-up rate for new fixed assets amounts to 8 to 10 percent of the total volume of capacities in service. Nonetheless, the time required for making the new projects operational, i.e. the time of incomplete utilization, is still considerable. According to the currently applicable norms, the duration of assimilation is between 1 and 3 years, whereas the time actually required is 1.5 to 2 times as long.

The length of the time required for putting new capacities in operation is to a large extent dependent on the operating personnel of the new enterprises. Of great importance are the timely training of the cadres, the organization of transport, and a guaranteed supply of raw materials, fuel and other materials. However, under the conditions of the new economic mechanism, the resource-producing sectors likewise play an important role. It is precisely these sectors that must insure the establishment of new capacities--capacities that are tested and ready to be put in operation in accordance with the plan specifications. This in particular is the distinguishing characteristic of the system of delivery of "turn-key" jobs, i.e. installations completely ready for operation under normal conditions. Under the new system, new projects can be accepted only upon completion of the preceding assimilation and start-up. The tune-up work of the machine building enterprises is of special importance in this respect.

According to the currently applicable norms concerning assimilation, the assimilation rate for new capacities in large-scale enterprises is 50 percent during the 1st year; during the 2nd year, it is 70 percent and in the 3rd year, 90 percent. Thus, during a period of 3 years, the losses due to the incomplete assimilation of capacities newly put in operation average 30 percent of their full capacity. If one takes into account that the assimilation time norms are transgressed, these losses are even greater. According to our calculations, the production arrears in individual sectors amount to 1.5 to 4 percentage points. Gradual abolition of the assimilation norms could accelerate the economic growth rates in the individual sectors by no less than one-third.

In our economic literature, the length of the assimilation periods for new enterprises is now and then referred to as an "eternal problem," which accompanies material production and technical progress at every stage of socialist construction. Such a point of view is incorrect, since it is at variance with the experience gained in the economic development of the USSR and with the data obtained abroad.

During the first 5-year plans and during the Great Patriotic War, new enterprises were put in operation quickly. During the war years, large-scale enterprises were moved and put in operation in new locations within a short time. For example, during the advance of the German-Finnish troops in Murmanskaya Oblast, the Monchegorsk Combine was relocated via the North

Sea to Noril'sk, where a mere 2 years later it began to produce the nickel needed by the country.

One of the reasons for the long duration of the process of putting new capacities in operation is the present practice of accepting construction projects in separate, uncoordinated stages, and of accepting equipment in "scattered deposits", without insistence on its being ready for production of the commodities needed.

In some scientific papers, it is suggested to lengthen the normative assimilation time and to include in it a period of so-called economic assimilation, extending over 6 to 7 years. It appears, however, that this is rather a question of thoroughly examining every violation of the assimilation time norms and of gradually reducing these norms.

The cardinal principle of our technical policy in the construction sector is the intensification of production, the maximum improvement of the effectiveness of capital investment. Our task is more and more to increase the production volume and improve the quality and variety of output through full and efficient utilization of the available production capacities and assets, through replacement of equipment, through introduction of the results obtained in contemporary science and engineering, and through an economy-oriented attitude toward every minute of working time and every gram of fuel and raw material. Consequently, it is necessary constantly to measure the expenditures against the results achieved, thus obtaining maximum returns from the producer goods of our national economy.

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Utilization of Credit Recommended

Moscow PLANOVOYE KHOZYAYSTVO in Russian No 3, May 80 pp 57-66

[Article by V. Rybin, doctor of economics sciences, professor and A. Khachatryan, candidate of economic sciences: "Improvement of Credit Extension for Capital Investments"]

[Text] Implementation of the construction program outlined at the 25th CPSU Congress is a prerequisite for insuring full solution of the social-economic and scientific-technical problems pertaining to the establishment of the material-technical basis of communism. According to the projections for the 10th Five-Year Plan, the planned indicators of economic development were to be attained at lower capital investment growth rates as compared to the preceding five-year plan; in absolute terms, however, capital investment increased considerably (R 621.4 billion). Priority is given now to the task of reducing the time required for the construction and assimilation of production capacities and fixed assets, while improving the quality of planning and of the construction and installation work.

In the last 4 years of the present five-year plan, approximately 1,000 large-scale industrial enterprises were put in operation. However, we must draw attention to the fact that during the first years of the five-year plan, the average annual increase in fixed production capital was slightly reduced. Large funds are diverted to unfinished projects, and construction of important economic projects is delayed. At the beginning of 1979, the

remaining unfinished construction projects equaled R 99 billion, i.e. 85 percent of the annual volume of state capital investment. Of 5,800 large-scale construction projects inspected by the USSR Construction Bank in 1978, over 11 percent had been started prior to 1966, and approximately 12 percent, during the period from 1966 to 1970. According to our calculations, accelerating the introduction of new capacities and bringing unfinished construction projects up to the normative level would serve to increase the national income by R 2.5 to 3 billion per year. Consequently, the principal task is to fight the dissipation of energy and capital and to focus the attention of the managing and planning organs on the completion of underway and priority projects.

The decree "On Improving Planning and Strengthening the Influence of the Economic Mechanism on Increasing Production Efficiency and Work Quality," which was passed by the CPSU Central Committee and the USSR Council of Ministers on 12 July 1979, represents an important stage in the improvement of the economic mechanism of capital construction. In regard to the system of measures intended to increase the effectiveness of capital investment, the decree gives prominence to the problems in regard to financing the capital investments and strengthening the influence of money and credit on the economic interests of the participants in the construction process. The improvement of the financing and loan practices is oriented toward raising the level of construction planning and toward introducing and strengthening cost-accounting relations. The complex of measures provides for increasing the influence of credit on an accelerated start-up of production capacities and projects, for bringing unfinished construction projects up to the norm level and for reducing the number of restarted projects.

Theoretically, the question concerning the expediency of a more active employment of credit in the field of capital investment was decided in the affirmative in the mid-1960's. We have now concretely and systematically defined the conditions for an intensive development of credit relations in the field of capital construction and in connection with this we have solved urgent problems. There are plans to give much greater prominence to credit as a source of funds directed toward the development of the national economy, to increase the share of credit in the financing of capital investments and on this basis to consolidate the links established by the plan among the participants in the construction cycle.

By its nature, credit occupies a special place among the economic instruments of economic operation. Requiring investment recovery and profitability of the measures financed through credit and reimbursement of the loans granted by the date specified, credit actively contributes to the development of cost-accounting relations in capital construction. It is distinguished by great maneuverability and flexibility and represents a stable foundation for encouraging initiative in finding more efficient ways of managing affairs; this is becoming apparent primarily in the builders' active orientation toward mobilization of their own intraorganizational

reserves for repayment of the loans by the date specified and in the consolidation of bank control over the implementation of the construction plans. As a systematically operating element of economic control, extension of credit contributes to the observance of the plan proportions in the distribution of resources and their utilization in accordance with state requirements.

The practice of financing capital construction through bank loans, which has been observed for the last few years, has shown that the necessity of repayment by a specified date tends to improve the utilization of material and labor resources and contributes to putting the projects and production capacities in operation as soon as possible. Thus, of 8,847 enterprises that in 1978 paid off loans, 53 percent put in operation the planned capacities by and before the date specified. Naturally, this situation is to a certain extent due to the fact that the projects selected for extension of credit are for the most part small ones that relatively quickly pay for themselves and that are equipped with the necessary material and labor resources.

The volume of credit for capital investments has been expanding considerably. The long-term loans granted by the USSR Construction Bank increased from R 0.2 billion in 1966 to R 8.7 billion in 1978. At the same time, nearly one-third of the investments financed through credit were aimed at re-equipment and renovation of operating enterprises. In 1978, 5,425 enterprises and construction projects used long-term loans as a state planning resource. This total included enterprises such as the Orsko-Khalilovo Metallurgical Combine of the USSR Ministry of Ferrous Metallurgy (estimated value R 89 million), which put in operation a universal mill with a capacity of 750,000 tons of rolled metal per year, and the Orsk Tractor Trailer Plant of the Ministry of Automotive Industry (estimated value R 103 million), the first section of which (capacity: 10,000 trailers per year) was put in operation. For technical re-equipment and renovation, loans were granted to 3,240 enterprises, 1,588 of which completed the projects financed through credit.

However, in spite of the positive experience accumulated and the resolutions adopted, credit has not yet assumed its appropriate place among the sources available for financing capital investment; evidence of this are the data--shown in the Table--on sources of centralized capital investment financed by the USSR Construction Bank.

1) Год	3)	2) Источники финансирования (in %)		
		бюджетные средства	собственные средства	долгосрочный кредит
1966		87,9	41,9	0,2
1970		49,3	48,4	2,3
1975		47,7	47,0	5,3
1976		47,7	46,3	6,0
1977*		40,0	49,9	10,1
1978		41,2	50,1	8,7

6) * С 1977 г. в общую сумму ассигновок средств на техническое перевооружение и реконструкцию.

Key:

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|--------------------------|--|
| 1. Year | 5. Long-term loans |
| 2. Financing sources (%) | 6. From 1977 on, the total includes funds for technical re-equipment and renovation. |
| 3. Budgetary funds | |
| 4. Internal resources | |

The question is how one can account for the fact that in spite of the advantages of long-term loans and the positive results obtained in using such loans, this method of credit financing has not been practiced as widely as required in the field of capital construction.

In our opinion, the principal reason is the fact that so far the system of the economic mechanism has not been properly oriented toward increased effectiveness of capital investment and accelerated obtainment of the final construction product. There has been no coordination of the conditions of capital allocation to capital investment with the results of investment assimilation, and the work of the organizations has been evaluated primarily on the basis of the degree of utilization of the allotments; this has not been conducive to orienting the builders toward the final results of investment assimilation. Under such conditions, there has been no interest on the part of the clients or of the planners, builders and equipment suppliers in availing themselves of the credit resources, since the use of credit is controlled by the banking organs and entails strict economic accountability for the results of construction. Rather, the clients and the builders have been interested in increasing the budgetary funds for capital construction, since under conditions of evaluation by the overall volume of capital investment assimilated their use involves a lesser degree of economic accountability.

There has been insufficient stimulation of an increased use of credit and of the operating system of capital investment planning. As is well known, of considerable importance in the recent past were the noncentralized capital investments which could exceed the limits stipulated in the economic development plans and which were financed through internal funds of the economic organs and through bank loans. The volume of noncentralized

expenditures reached nearly 20 percent of the total state capital investments; this sharply increased the number of construction jobs carried out at the same time and led to an unfavorable manpower resources balance in the field of capital construction.

The increase in the number of unfinished construction jobs, the scattering of funds among a multitude of projects and the diversion of resources to secondary construction projects made it necessary in 1973 to include the noncentralized capital expenditures in the national economic plan and their volume was reduced. The objective was to regulate the planning, to balance the resources used in capital construction and to concentrate them so as to put in operation as soon as possible the projects under construction.

At the same time, this measure led to certain negative consequences: The enterprises and associations showed less initiative in trying to find additional ways of increasing production efficiency through relatively minor organizational-technical measures. This also affected the use of long-term loans, since under these conditions the management organs' principal task was to insure the project's inclusion in the plan, which inclusion guaranteed allocation of funds for construction; here the management organs were interested in obtaining nonreimbursable budgetary funds rather than repayable loans.

In the capital investment plans, the credit resource was as a rule relegated to a position of irrelevance. It was brought up for discussion only when there was a lack of funds from other sources. The plans for extension of long-term credit were drawn up for 1 year and the banking organs' participation in the long-term planning of capital investments was practically restricted to their submitting to Gosplan RSFSR their views concerning the practicable volume of investment credit. Due to this practice, it was impossible to balance and coordinate the plans with the sources for financing them; this practice complicated the planning in regard to the long-range long-term loan requirements and it interfered with coordinating the capital input plans with the material, labor and financial resources and with the plans concerning the development of the individual sectors of the national economy.

The decree by the CPSU Central Committee and the USSR Council of Ministers on improving planning and strengthening the influence of the economic mechanism removes many of the aforementioned obstacles and creates the conditions necessary for a broader and more effective application of credit in the field of capital construction. The measures outlined in the decree in regard to introducing into practical planning a system of continuous and mutually coordinated long-term, five-year and annual plans raise new requirements concerning the organization of credit planning. From now on, the national five-year plan for economic and social development will comprise an aggregate financial balance (including an annual breakdown of income and expenditures) which will be submitted to the USSR Council of Ministers and which is to make provision for the supply of financial

resources, including credit, for all of the planned economic development measures. Bank loans will be among the primary sources in the formation of these resources. Taking this into consideration, the banking organs have to draw up and submit to Gosplan RSFSR estimates (including an annual breakdown) of their long- and short-term loan requirements for the five-year period.

The given situation confronts the planning, financial and banking organs with new tasks in regard to correlating and coordinating the planning and utilization of financial resources in the field of capital construction and raising the level of planning. We are concerned here with the necessity to draw up a unified five-year financial and credit plan--with due regard for insuring material and technical supplies--which will serve as the foundation for the utilization of financial and credit resources and which will be based on the five-year plans for capital investment. It will thus be possible to balance the capital investment plans with the financial and credit resources, considerably to intensify the stimulatory influence of credit in regard to increased effectiveness of capital expenditures and to coordinate the plans for financing these expenditures through credit with the economic and social development plans on all levels of economic management.

In accordance with the new system, the financing of state capital investments in industrial construction projects will be continuous. The continuity will largely be achieved through bank loans granted within the limits of the long-term credit allocations for the respective year. In the event of overfulfillment of the quarterly capital investment plans, credit will be extended irrespective of the quarterly apportionment of the annual quotas. In the event of overfulfillment of the annual plan, the banks will grant supplementary loans. All this will create conditions that will contribute to continuity in financing, to safeguarding the material basis of the construction sector and to speeding up the putting in operation of production capacities.

In drawing up the credit plans, the banks as a rule give preference to projects that meet the primary requirements of the national economy and that guarantee speedy reimbursement of the outlays, i.e. selection is based on the final operational results of the project marked for construction or renovation, results that reflect its real contribution to economic development. This is why it is expedient to extend the range of application of long-term credit and to extend such credit to operating plants of low profitability, if the projects provide for conversion of these enterprises to steady profitability as a result of their renovation and technical re-equipment. Continuation of the present system under which the requirements of such enterprises are for the most part met through budgetary funds does not make for an efficient utilization of these funds.

Aiming to develop credit relations in the field of capital construction, the aforementioned decree by the CPSU Central Committee and the USSR

Council of Ministers provides for the gradual planned transition of individual sectors to the construction of enterprises (installations) by means of credit granted by the USSR Construction Bank to contracting construction organizations in the amount of the total estimated cost of the construction of the enterprise (installation), including delivery of the projects to the buyer in a state of "turn-key" readiness. Certain prerequisites for this have already been established in that in a number of leading industrial sectors long-term loans are used extensively: In the USSR Ministry of Petroleum Refining and Petrochemical Industry, such loans account for 41 percent of the financing capital for industrial projects, while the long-term loans for the Ministry of Chemical Industry, the Ministry of Food Industry and the Ministry of Nonferrous Metallurgy account for 36, 31 and 27 percent, respectively.

Such a system of financing construction has been experimentally tested since 1970. In these tests, the contractors' outlays for construction and installation work and for the incoming equipment have been recovered through bank loans; this has served to increase the contractors' economic accountability and their motivation for completing the construction project as speedily as possible. The experiment has shown that such a system makes for increased effectiveness of capital investment: Of 27 projects put in operation, 19 were delivered by and before the date specified, and 10 enterprises realized savings of approximately R 1 million (17 percent of the estimated cost) against the cost estimate.

Intensification of the influence of credit on increased effectiveness of capital investment is not restricted to a simple broadening of the scale of credit extension. In this regard, a great deal depends on the functioning of the credit mechanism: Does it sufficiently stimulate the management organs to examine the objective credit requirements and does it impel them to take the measures necessary to increase the effectiveness of the expenditures financed through credit?

An important element of the credit mechanism are the economic control instruments--the interest and the repayment schedules. So far, however, the interest rates for long-term loans have not performed their stimulatory function. Up to now, the annual interest charged for time loans has been 0.5 percent, and the rate for overdue loans, 1.5 percent; in the event of project delivery before the date specified, the interest rate has been reduced to 0.25 percent--a rate considerably lower than both the tax on capital (on average 6 percent) and the coefficient of capital investment effectiveness (12 percent). These conditions have created a situation, in which it has been economically more advantageous to the enterprise to delay repayment of the loan (paying 1.5 percent on the overdue loan) than to repay on time and pay from the part repaid a 6-percent tax on capital.

The interest plays a dual role--it both stimulates and limits the use of credit, and this presupposes the necessity of an essential difference between regular interest rates and penalty rates. Thus, increasing the interest rates charged in the event of nonfulfillment of the plan quotas

and violation of planning and financial discipline in regard to all types of loans granted for unfinished construction projects (in the event of transgression of the construction deadlines) and for equipment payments (in the event of transgression of the deadline for installation) will help to bring about capital savings and to strengthen the influence of the interest rates in regard to capital investment effectiveness.

The regulation of interest rates is an essential element of the differentiated system of credit extension to contracting organizations and construction projects. In order to increase the stimulatory effect of the interest, the savings realized in connection with the reduction of construction time should in part be used to increase the worker incentive fund of the management organizations. Additional expenditures in connection with collection of higher interest should be defrayed from the part of the incentive fund used for payment of bonuses to managers and ITR [engineering and technical workers] without exceeding 50 percent of this part of the fund, and the rest should be paid from the management organization's profit.

The banks' influence is not limited to the fixing of preferential or penalty rates on loans. It is necessary to take harsher measures as well, right up to exclusion of enterprises from the extension of credit.

One of the most important conditions for accepting newly started construction projects for financing is the presence at the contracting organizations of the capacities and equipment necessary for putting the projects in operation within the time limits conforming to the approved construction time norms. In the event of nonfulfillment of these requirements, the bank does not accept the newly started construction jobs and projects for financing and demands their exclusion from the capital construction plans, title lists and contract work programs. Thus, in 1978 6,467 construction jobs and projects with an annual capital investment volume of R 801 million, including 2,022 newly started construction jobs and projects (investment volume R 326 million) were excluded from the capital construction plans and intra-project title lists on account of insufficient capital investment allocations for underway and carry-over projects; 2,041 construction jobs and projects valued at R 178 million were excluded due to the fact that the allocation of capital investments to these projects had involved violation of the construction time norms.

The bills for work carried out at construction jobs and projects not accepted for financing are returned by the bank unpaid. If in spite of the sanctions the contracting organizations continue their work at such construction jobs and projects, the bank's institutions can use the financial and credit-related control instruments at their disposal so as to put an end to such construction methods. In 1978, bank sanctions were applied against 5,366 contracting organizations. A large number of these organizations were transferred to a special credit system. Audits frequently disclose instances of violation of planning and financial discipline: For

1978, such violations were disclosed in 571 organizations that had done work on 899 projects not included in the plan. The contracting organizations diverted R 43 million worth of their own working capital to the construction of projects not included in the plan. It appears that organizations permitting diversion of their own working capital to the construction of projects not included in the plan should ultimately be excluded--as is in fact being done--from all types of bank credit. Of the total number of organizations audited, the number of organizations declared ineligible for credit for these reasons has during the last 4 years declined to approximately one-half of the previous level.

Credit exerts an influence in regard to the observance of procedures and the increased effectiveness of capital investment not only through interest rates, but also--being repayable--through the operating system of loan repayment. Most interesting in this regard are two aspects--the schedules and the sources of loan repayment.

At present, the repayment of loans and the payments for other intra-organizational requirements specified in the financial plans of the enterprises and associations (including the financing of that part of the capital investments which exceeds the limits of the production development fund) are made with that part of the profit which remains after the priority payments and after the formation of the economic incentive fund. One should recognize that this practice does not impel the management organizations efficiently to utilize their funds, since the payments are actually made from the net profit surplus, i.e. from funds which otherwise would have been budget revenues.

On account of the new system of allocating the funds for production development from the profit on a stable normative basis and of fixing the plan-guaranteed profit share designated for defrayment of capital expenditures not only for 1 year, but also for the long term, it will be possible to finance expanded reproduction on a truly cost-accounting basis.

The establishment of loan repayment schedules is of great importance in regard to increased efficiency of capital utilization; it is directly dependent on the planned construction cycle schedules. Nonetheless, in connection with nonfulfillment of the plan for construction and installation work and with delays in the assimilation of newly introduced capacities, there has been extensive adjustment of loan repayment schedules. This diminishes the role of credit and is detrimental to its influence on the timely fulfillment of the construction plans. It seems to us that hard and fast loan repayment schedules should be established already at the time the loans are paid out and that they should be established on the basis of the approved construction title lists and of the corresponding norms of construction duration and reimbursement of capital investments.

The system of measures concerning the improvement of the economic mechanism will be developed not only from the basis of activation of credit levers

and stimuli in regard to increased effectiveness of capital investment. The decree passed by the CPSU Central Committee and the USSR Council of Ministers provides for extension of credit relations between all the participants in the construction process and the banking organs in the various sections. Under a system of management insuring equal economic motivation on the part of the banks, buyers, planners, builders and equipment suppliers in regard to the effective implementation of their functions from the point of view of the final economic result, the economic instruments used by the bank can operate "at full power."

In regard to planning and research work, credit relations until recently played a very minor role. The extension of settlements of this work has led to a certain increase in the volume of unfinished project planning and accordingly has made it necessary to provide the planning organizations with their own working capital. Within the limits of normative needs, this capital has so far been made up of the buyers' advance payments, while requirements exceeding the norms have been met through bank loans. Further improvements in regard to the settlement of planning and research work will be achieved by discontinuing the practice of breaking this work down into stages and by changing over to settlements between the buyers and the planning and research organizations for fully completed and buyer-approved projects involving the construction of enterprises, priority complexes, sections and projects. The expenditures of the planning organizations prior to the plan target date for project delivery will be defrayed with their own working capital, with bank loans and with funds made available on the part of the buyers in connection with the change-over to settlements not involving intermediate payments. Upon expiration of the plan deadline for project delivery, credit will be continued with higher interest being charged on the loans.

The credit-accounting mechanism in the field of capital construction is presently oriented toward converting the estimates into a fixed planning and financing standard and toward a credit-based stimulation of projects developed on the basis of progressive, scientific-technical solutions that facilitate an efficient utilization of material, financial and labor resources. The extension of credit to the planning and research organizations, the introduction of payment for complete plans and estimates and the differentiation of interest rates in accordance with observance of the project planning deadlines and of planning quality will make it possible more fully to utilize credit and to strengthen its influence in regard to accelerated drafting of estimates, inclusion in them of the latest scientific and technological advances and orientation toward progressive production methods.

It is advisable not only to develop the extension of credit to the planning organizations, but also to grant loans to cover the buyer's expenditures on the planning of future construction. In such a case, the planning and research work will be paid from long-term loans granted to the buyer, with the subsequent loan payments made with capital derived from the buyer's

principal line of work. This will help to increase the buyers' accountability for an efficient utilization of the loans and for putting the project in operation as soon as possible, thus preventing the wasting of money on project planning.

We have now largely solved the problem concerning settlements between the buyers and the construction and installation organizations for finished projects and major work stages without intermediate payments on the basis of cost estimates for the construction and installation work. Thus, in 1978 settlements of projects as a whole were made for 60.3 percent of all paid construction and installation operations, as compared to 56.4 percent in 1977. However, these settlements were made irrespective of whether the projects being built were put in operation, since completion of the projects or of the stages of construction and installation work did not signify their readiness for starting production, but only the value of the amount of work completed. Nevertheless, such settlements exert an influence on the reduction of construction times. Whereas in 1970 the actual construction terms amounted to 6.8 years, in 1977 the terms had been reduced to an average of 5.2 years. During the same period, the average duration of capital use in unfinished construction projects declined from 16 to 13 months.

The decree passed by the CPSU Central Committee and the USSR Council of Ministers provides for completing at the beginning of the 11th Five-Year Plan the transition to a progressive form of settlements between the buyers and the construction and installation organizations--settlements--based on the estimated value of the construction output--for completely finished construction and for enterprises, priority complexes, sections and projects delivered for start-up and ready for the production of goods and the rendering of services. The transition to the new system of settlement puts an end to the advances paid by the buyers to the contractors for expenditures on unfinished construction and installation work. Up to the plan deadline for delivery of the construction output, the expenditures will be covered by bank loans, and the loans will be financed with the buyer's capital made available through the abolition of the intermediate payments.

Under the new system of settlement, the problem concerning the formation of the contracting organizations' working capital assumes special importance. At present, the working capital is for the most part made up of temporary funds--the advance payments by the buyer--while the proportion of internal resources and bank loans is insignificant. Thus the share of loans of the total working capital of the construction organizations presently amounts to approximately 18 percent, while in industry it reaches 45 percent. Consequently, the financial status of the contracting organizations depends to a large extent on the timely and full receipt of the buyers' advance payments rather than on the results of the economic activity. Under these conditions, the contractors are not interested in efficient capital utilization; moreover, they have been receiving the advances before the rendering

of services, frequently accumulating considerable capital irrespective of the volume of work carried out.

Through the extension of credit to unfinished construction projects, it will be possible to institute more effective bank control over the progress of the construction and installation operations and over the implementation of the plan for putting the capacities in operation and to introduce a system under which the contractor would receive money from the buyer only upon completion of the entire job and start-up of the capacities. The abolition of advance payments by the buyer for covering the expenditures on unfinished construction and the transition to payment for finished enterprises and other projects ready for the production of goods and the rendering of services will help to improve the financial status of the contracting organizations, efficiently to organize the working capital in the construction industry and to activate the organizations in regard to effecting a reduction of construction times. The fact that the bank will control the progress of construction up to the point of completion and delivery of the finished project to the buyer is likewise of great importance.

Experiments conducted in regard to direct bank loans for unfinished construction and installation work and in regard to introduction of settlements concerning completed projects have proved highly effective. On the basis of these experiments, a change-over is being effected to settlements between the buyers and the general suppliers of equipment involving sets of equipment delivered or installed en bloc (in the case of delivery of complete sets of technical equipment, manufacturing lines, installations, and means of mechanization, automation, regulation and control). Up to the plan deadline for complete delivery of the entire complex of equipment or its installation, provision is made for extension of bank credit to the general supplier. Upon expiration of the credit allocation period established by the plan, it is intended to charge a higher rate of interest.

However, delivery of complete sets of equipment and even the start-up of the equipment before the target date specified create no more than an opportunity for achieving economic gains, just as by themselves the individual efforts of the planners, contractors and buyers do not guarantee an effective use of capital investments. By itself, the credit mechanism cannot solve the urgent problem of increasing the effectiveness of capital investment; it must operate as part of an adjusted economic mechanism oriented toward increasing the efficiency of total social reproduction.

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Maximum Investment Yield Urged

Moscow PLANOVOYE KHOZYAYSTVO in Russian No 3, Mar 80 pp 77-81

[Article by G. Kharchenko, second secretary of the Zaporozh'ye obkom of the Ukrainian Communist Party: "Maximum Yield for Every Capital Investment Ruble"]

[Text] The present stage of social development is characterized by the intensified influence of the Party in all spheres of the country's material and spiritual life. This pattern reflects the objective requirements of communist construction.

The principal objectives of the Party are embodied in the concrete work of the party organizations, which is directed above all toward uniting the efforts of the work collectives, generalizing the experience of the leading organizations, mobilizing the workers for the fulfillment of the state plans, speeding up technical progress and improving labor productivity and work quality.

The Zaporozh'e Oblast Committee of the Ukrainian Communist Party regards the solution of these problems as the most crucial party assignment. In consequence of the implementation of purposeful measures, very good results have been achieved in the oblast, especially in regard to effecting an improved utilization of labor resources. L. I. Brezhnev positively evaluated these achievements: "Due to the results achieved in the overall mechanization and automation of production, in the improvement of technical processes and work organization at the enterprises and construction projects, it has been possible from the beginning of the current five-year plan to overfulfill the plan targets for increasing labor productivity and to lighten—over and above the targets set—the work load of more than 6,000 workers.

The obligations, which the workers assumed for the 10th Five-Year Plan in regard to reducing significantly the proportion of heavy manual labor, testify to their truly methodical and communist approach to the implementation of the resolutions adopted by the 25th CPSU Congress."¹

For the party organization, the present stage in the reorganization of the economic mechanism is of crucial importance. In the system of measures stipulated by the decree of the CPSU Central Committee "On the Further Improvement of the Economic Mechanism and the Tasks of the Party and State Organs" and by the decree of the CPSU Central Committee and the USSR Council of Ministers "On Improving Planning and Strengthening the Influence of the Economic Mechanism on Increasing Production Efficiency and Work Quality," great importance is attached to the capital investment policy.

A fundamentally new element in regard to the solution of the problems concerning the effectiveness of capital investment is the stipulation that capital for new construction and expansion of enterprises be allocated in the event that the requirements of the national economy at the present stage of production cannot be met by the operating enterprises on the basis of renovation and technical re-equipment.

It is also planned immediately to allocate the necessary quotas of capital investment, construction and installation work, material resources and equipment for the renovation and re-equipment requirements of operating enterprises.

In this case, economic calculation comes not only to thrifty handling of the accumulated material wealth. In the first years after the Great Socialist October Revolution, V. I. Lenin criticized negligent managers and

reproached them for "not being concerned about saving the kopeck given to them and not trying to convert it into 2 kopecks, but instead drafting plans for billions..."² Thus, a policy of economy in the broadest sense of the word is not merely preservation and efficient utilization, but also augmentation of resources.

The work experience gained over many years by the Zaporozh'e enterprises has demonstrated the economic expediency and indisputable advantage of renovation, as compared to new construction. The city's complex of enterprises for ferrous and nonferrous metallurgy was developed before the Great Patriotic War. It is characterized by a high degree of building density and the lack of reserve space for the construction of new aggregates for the production of steel, cast iron, rolled stock, aluminum and other types of products. Nonetheless, output of products has year after year been increasing and presently it is 2 to 3 times greater than the capacities originally put in operation. On account of systematic technical re-equipment of the enterprises, it has since 1965 been possible to renovate 3 blast furnaces, 6 open-hearth furnaces, 9 electric steel furnaces and 1 slabbing mill, and to modernize 11 rolling mills.

In the last 7 years alone, R 537.4 million--i.e. 90 percent of the total capital investments assimilated--were spent on the renovation and modernization of operating plants in the metallurgical industry of Zaporozhskaya Oblast. And these measures have been carried out only during the planned major overhauls. A contributing factor in this regard is the large-block assembly welding of metallurgical aggregate structures, which method was assimilated during the restoration of the "Zaporozhstal'" Plant and which subsequently has been adopted all over the country. The renovation of a blast furnace--involving a capacity expansion by 220,000 tons of cast iron--took no more than 80 days. Overall, the net capacity of the plant's renovated blast furnaces was increased by 511 cubic meters. The plant developed and introduced tuyeres of a new design, the durability of which was increased 22-fold, and it created the conditions necessary for raising the temperature of the blast-furnace air. Due to a number of other measures, the coefficient of furnace net capacity use was raised to 0.518 as against 0.647 in 1965, and coke input per 1 ton of cast iron was reduced from 543 to 475 kilograms.

Through renovation, it was possible to increase the average charge in open-hearth furnaces by 3,284 tons. In a relatively short time, two open-hearth furnaces were converted into double-bath aggregates, as a result of which conversion steel production increased to 437,000 tons per year. As a result of the modernization of the structures and basic assemblies of other furnaces, it was possible to improve the integrated use of natural gas and oxygen in open-hearth production, to intensify the steel-smelting process and to reduce its duration from 7.73 to 5 hours.

Experience has shown that the problems in connection with quality and with insuring excellent final results of the renovation and modernization work

cannot be solved by the planning institutions alone. It is imperative that we involve in this work the creative potential of the collectives and shops. Upon maturation of the plan of renovating the "Zaporozhstal'" Plant's sintering shop, there was established--on the initiative of the party bureau and the shop management--an integrated brigade of highly qualified specialists, who inspected all the sections that had mostly been using female labor. The brigade became a pivotal point, mobilizing the creative initiative of the efficiency experts, innovators and production pace-makers in finding ways of eliminating heavy manual labor.

The close contact with the planning institutions and engineering services of the plant led to the establishment of fundamentally new equipment and automatic systems: gravimetric dosing devices, electrovibration feeders, charging units for sintering and other machines. On account of the use of materials made of high-tensile steel, it was possible to increase the reliability of the equipment and to extend 5 to 20-fold the intervals between repairs. The introduction of mechanization and automation in every section raised the standards of production and created favorable working conditions; thus the output per worker was increased to 15,300 tons of sinter, whereas the average output in the sector amounts to 8,000 tons. Down time of basic equipment was reduced to a minimum (0.26 percent). There is practically no cadre turnover in the shop.

The renovation and modernization of the rolling mills during the major overhauls raise their productivity per hour of hot rolling on account of increased capacity in regard to introduction, speed, precision and quality. Thus, on account of the pertinent measures taken, the output of slabs by the slabbing mill at the "Zaporozhstal'" Plant was increased by 2,000 tons per day. In the thin plate hot-rolling mill, a system has been adopted for the automatic regulation of strip gauge and tension, which permits metal rolling with negative tolerances.

Analogous systems are being successfully employed at other rolling mills. The rolled stock savings achieved through this measure alone amount to over 30,000 tons per year; all in all, during the last 5 years the metallurgists of the "Zaporozhstal'" Plant saved 154,000 tons of metal for the national economy.

Efficient renovation calls for an integrated approach to the development of production and does not allow production imbalance. Thus, along with expanding the capacities of the basic metallurgical aggregates, the enterprises have taken steps to eliminate bottlenecks at subsidiary plants and sections. For example, during the renovation and modernization of its electric steel furnaces and rolling mills, the "Dnepropetsstal'" Plant expanded the metal-trimming sections and introduced continuous quality control.

In the processing shops, the plant set up 90 lathes, 4 mechanized lines for trimming metal bars and 2 semiautomatic lines for the dressing of structural

rolled stock. The grinder's job, which involved heavy manual labor, was eliminated.

The plant expanded its roads for motor vehicles, built driveways providing access to the shops and successfully implemented motor vehicle transport of industrial shipments, thus increasing the maneuverability and flow of intraplant transport.

Through the integrated approach to the renovation and modernization of production facilities and the introduction of new equipment and advanced manufacturing processes, the workers of the "Dnepropetrestal'" Plant were able--without any expansion of the production space--to increase steel output by 42.4 percent, as compared to the output volume of 1965, while the output of rolled stock and cold-drawn steel was increased by 44.4 and 45 percent, respectively.

Thanks to the experience gained in the oblast in regard to raising production efficiency by increasing the production capacities through renovation and modernization, the cast iron output during the aforementioned period increased by 1.3 million tons, while the output of steel and rolled stock increased by 1.63 million and 1.365 million tons, respectively; the output of crystalline silicon increased 2.5-fold, and that of sponge titanium, 2-fold, while the output of electrode hearth furnaces increased by 53 percent.

On account of the systematic technical re-equipment of the metallurgical production facilities, a relatively high level of mechanization has been attained in regard to labor-intensive processes: In the basic production processes of ferrous metallurgy plants, the rate of mechanization is 65 percent, while nonferrous metallurgy plants show an average rate of 70 percent. As a result, the oblast's production volume has increased mainly on account of the increase in labor productivity, practically without any increase in the number of workers. According to calculations, to obtain such an increase through new construction would have required capital investments 1.5 to 2 times as great, exclusive of the losses resulting from extended construction terms.

The systematic solution of the problems concerning reduction of manual labor, especially heavy manual labor, is a feature characteristic of the renovation and technical re-equipment of operating enterprises. The targets for the reduction of manual labor will be set in the 11th Five-Year Plan. In the report by the CPSU Central Committee to the 25th CPSU Congress, it was pointed out that in the current five-year plan "it will be necessary to rely not on the recruitment of additional manpower, but only on increased labor productivity. Sharp reduction of the proportion of manual labor and integrated mechanization and automation of production have become an indispensable prerequisite for economic growth."³ It is also on account of the demographic situation resulting from the consequences of the war that a solution of these problems is imperative.

In Zaporozhskaya Oblast, a complex system of reducing manual labor is in operation. Implementation of the program drafted will make it possible during the current five-year plan to raise the mechanization rate in industry by 12 percent and to bring its overall rate up to 59 percent; in the construction sector, the mechanization rate can be increased by 8 percent, and in agriculture, 1.5- to 2-fold.

Under the control of the oblast committee of the Party, the rates of the technical re-equipment of plants are increasing. During the current five-year plan, capital investments in measures involving mechanization and automation and in the modernization of operating equipment increased from R 27.6 million to R 41.6 million per year. Thus it was possible to implement 4,000 organizational and technical measures intended to reduce manual labor. Approximately 500 automatic and mechanized flow lines were put in operation. In the course of 3.5 years, the industrial sector achieved economic gains amounting to R 189 million; production costs decreased by R 67 million and above-plan commodity sales amounted to R 155 million. However, the most important effect--the social effect--consists in the fact that in industry and in the construction sector the work of 32,000 workers was mechanized, while in agriculture, mechanization involved 19,000 workers; 16,000 workers, including 7,000 women, were released from heavy manual labor.

At the Zaporozh'ye Transformer Plant, the purposeful work in the aforementioned field has produced concrete results. In this plant, thousands of tons of sheet metal had been processed manually (for the most part by women). As a result of the introduction of a complex of devices developed by specialists of the plant for the magnetic circuit shop, the content and conditions of the work were changed. Whereas before the complex modernization of the shop 1,000 workers had produced magnetic circuits totaling 60 million kilovolt-amperes, at present 500 workers have attained a level of 85 million kilovolt-amperes.

A weak link at the plant are the loading and unloading operations. The loaders are under any conditions guaranteed high wages; they receive protective clothing, free meals and medical care. However, the young people do not want to be loaders. The proportion of such workers is especially marked at the metallurgical enterprises that process a large amount of bulk loads.

The experimental shop of the aluminum plant, which comprises a design bureau and a machine shop, developed and produced a complex of special machines, mechanisms and devices. R 2.5 million had been allocated to this work from the development fund. As a result, there was attained a very high rate of mechanization of transport and storage work--97 percent; manual labor was eliminated and in individual loading and unloading sections labor productivity increased 8- to 20-fold; 27 workers were released, with an operator of loading and unloading equipment replacing the loaders.

In our opinion, withdrawal from the ministries of the right centrally to control the development funds of the enterprises and arrangements to make possible local utilization of the funds would help to promote initiative in solving the complex problems concerning the mechanization of auxiliary, transport, and loading and unloading work through modernization and renovation.

It seems that the requirement raised in the decree, namely to increase the relative share of expenditures on equipment within the structure of capital investment should also fully pertain to control of the structure of capital investment in renovation. Sometimes the latter is justified only by the fact that it is merely the buildings and installations that are in unsatisfactory technical condition. Subsequently, however, the same old equipment is pulled into the renovated buildings. This is what happened at the Voykov Instrument Plant (in Zaporozh'e). In 1980, its renovation will be completed, but in the shops there remains the same universal metal-cutting equipment, which requires a large number of lathe operators as well as manual labor, since it is impossible to turn this equipment into a flow line, extensively to use multi-bench maintenance and to solve the problems concerning intershop transport of unfinished work pieces and components.

In calculating the economic efficiency of renovation and modernization, one should take into account the effect of the qualitative improvement of output. It was precisely on account of such efforts that it was possible at the transformer plant to increase the output of top-grade products to 52 percent, at the "Orsel'mash" Plant, to 91 percent, and at the Titanium-Magnesium Combine, to 45.7 percent.

Today we are turning out over 700 articles bearing the quality seal, i.e. 18.6 percent of the oblast's total volume of industrial production.

The solution of the problems concerning reduction of manual labor leads to a conclusion which we feel is very important: When approving the plans for new enterprises or the renovation and modernization of old ones, one should take into consideration the level of mechanization attained in the sector, not only in the basic, but also in the ancillary production sectors. It happens not infrequently that in regard to the level of mechanization of all production processes, newly introduced production facilities cannot be considered exemplary. A contradictory situation is manifesting itself: On the one hand, there is a rise in the level of mechanization in industrial production and on the other hand, there is an increase in the number of workers engaged in unproductive manual labor.

With the increase in the number of first-rate automated and semiautomated lines and lathes equipped with numerical preset controls at the machine building enterprises of the oblast, the number of transport workers, attendants, carriers, haulers, etc. has in the last 10 years increased 2.5-fold—an increase greater by far than that of the total number of workers.

In increasing the productivity of an equipment unit or set of machinery, the manual labor input in its maintenance, repair or tune-up is not always taken into consideration. Consequently, the inclusion in the plans of a section entitled "The Level of Complex Mechanization and Automation of Production Processes" will help to provide for a reduction of the share of manual labor. According to an analysis, in the ancillary production sectors the effectiveness of capital investments aimed at the release of manpower is greater than in the basic production sector.

The practices examined testify to the great possibilities in regard to the development of the workers' creative initiative in the implementation of the resolutions of the 25th CPSU Congress, of the targets of the 10th Five-Year Plan, and of the tasks of communist construction.

FOOTNOTES

1. L.I. Brezhnev, "Leninskim kursom. Rechi i stat'i" [On Lenin's Course. Speeches and Articles], Moscow, 1978, p 505.
2. V.I. Lenin, "Polnoye sobraniye sochineniy" [Complete Works], Vol 45, p 16.
3. "Materialy XXV s'ezda KPSS" [Materials of the 25th CPSU Congress], Moscow, 1978, p 43.

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REGIONAL DEVELOPMENT

NATIONAL IMPORTANCE OF SIBERIAN ECONOMY EMPHASIZED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 4, Apr 80 pp 83-106

[Article by Prof A. G. Granberg, doctor of economic sciences and deputy director of the Institute for the Economics and Organization of Industrial Production under the Siberian Division of the USSR Academy of Sciences in Novosibirsk: "Siberia in the National Economic Complex"]

[Text] In recent decades Siberia has turned into one of the major economically developed regions with a clearly expressed specialization in the national territorial division of labor. This region is having an ever growing impact on the Soviet economy, and for this reason an analysis and estimate of the present state as well as the trends and prospects of Siberia's economic development must be approached primarily from the national economic standpoint, as an inseparable part of the unified national economic organism.

Such an approach is a characteristic trait of the long-range strategy of the CPSU and the Soviet state, and is expressed in a rise in the economic potential of the eastern regions of the nation and a rise of their role in national production.

The 25th CPSU Congress outlined new targets for the integrated development of the natural riches and for the development of Siberia's productive forces. Of important significance for carrying out these tasks was the trip of the General Secretary of the CPSU Central Committee and Chairman of the Presidium of the USSR Supreme Soviet, Comrade L. I. Brezhnev, to the eastern regions of the country.¹ The comments and proposals voiced by Comrade L. I. Brezhnev in the course of his meetings and talks with the workers and party-economic activists have been used by the Siberian Division of the USSR Academy of Sciences in working out the comprehensive Siberia Program.

¹ "In the Politburo of the CPSU Central Committee, the Presidium of the USSR Supreme Soviet and the USSR Council of Ministers. On the Results of the Trip by the General Secretary of the CPSU Central Committee, the Chairman of the Presidium of the USSR Supreme Soviet, L. I. Brezhnev, to the Regions of Siberia and the Far East," PRAVDA, 15 April 1978.

The Present Economy of Siberia

Over the last 20 years, the economic development rates of Siberia have steadily surpassed the national averages. As a result of this, the proportional amount of Siberia in the economic potential of the nation has constantly increased (see Table 1). Even now, in terms of the achieved scale of

Table 1

Change of Siberia's Share in the National Economy, in %

	1965	1970	1975	1980 (Est.)
Gross social product	8.1*	8.5*	9.1*	9.5-9.7*
Produced national income	7.5*	9.1*	10.0*	10.3-10.5*
Gross industrial product	8.1	8.4	8.9	9.4-9.6*
Gross agricultural product (annual average for 5-year period)	8.2	8.1	8.0	8.0*
Volume of construction-installation work	12.2	12.2	13.2	14.0-14.5*
Freight turnover for all types of transport.	13.7	14.2	15.7	17-18*
Industrial productive capital	10.5	11.0	11.5	11.8-12.2*

* According to the estimates of the IEIOPP [Institute for the Economics and Organization of Industrial Production] of the Siberian Division of the USSR Academy of Sciences.

production, Siberia surpasses all the Union republics, with the exception of the RSFSR and the Ukraine. Siberia produces a gross social product and national income that are 2.5 fold greater than in Kazakhstan, 2-fold more than in all the Central Asian republics and more than in the republics of the Baltic, Transcaucasia and Moldavia, taken together.

The chief factor in the accelerated economic development of Siberia is the presence in this region of very rich natural resources, including mineral, water, forest and soil. These resources which possess a high effectiveness are capable of covering a significant portion of the domestic [and] export needs of the nation for a long time to come. A major result of the industrial development of Siberia has been the creation of a basis of heavy industry in the Kuznetsk Basin, an industrial belt along the Transsiberian Mainline, the large oil and gas complex in Western Siberia, the hydropower centers in the Angara-Yenisey region, and the nationally important bases for the production of nonferrous metals, lumber and wood-processing products, and energy-intensive chemicals.

By the end of the 9th Five-Year Plan, Siberia produced more than 20 percent of the total product in the Soviet extracting industry, 25 percent of all the fuel and energy resources (including 30 percent of the coal and oil), 25 percent of the lumber, about 10 percent of the ferrous metals, and a significant share of many chemicals. In terms of the per capita production of oil, coal, electric power, lumber and a number of other products, Siberia surpasses not only the Union average but also a predominant majority of the developed capitalist countries.

Because the growth rates for a majority of Siberia's industrial sectors surpass the Union averages, the share of the given region in providing the increase in national production is markedly higher than in the achieved absolute production volumes. Thus, during the 9th Five-Year Plan, Siberia

Table 2

Production of Basic Types of Fuel in Siberia in 10th Five-Year Plan¹

Type of fuel	Unit	1980 production			Production increase 1976-1980		
		a	b	c	a	b	c
Oil (including gas condensate)	mln. tons	606	315	52.0	115.2	167	145.0
Gas	bln. m ³	435	160	36.8	145.7	121.4	83.3
Coal	mln. t	745	240 ²	32.2	43.7	36.3 ²	83.0

¹ "Narodnoye Khozyaystvo SSSR v 1978 g." [The Soviet National Economy in 1978], Moscow, Statistika, 1979; "On the 1980 State Plan for the Economic and Social Development of the USSR and on the Course of Fulfilling the State Plan for the Economic and Social Development of the USSR in 1979," PRAVDA, 29 November 1979.

² According to the plan of the 10th Five-Year Plan.

[Key: a--USSR; b--Siberia; c--share of Siberia (in %).]

provided 9.6 percent of the increase in total industrial product, 38.4 percent of the increase in the product of the fuel industry (including 83.2 percent of the increase in oil output and 32.9 percent for coal), 17.9 percent of the increase in the lumber industry product (including 83.2 percent of the increase in lumber hauling), 16.5 percent of the increase in the output of electric power, 19.9 percent of the increase in the production of rolled metals, and for a number of product types (for example lumber) not only provided the entire national increase but also compensated for the drop in production in other regions.

Beginning with the 10th Five-Year Plan, Siberia has had a determining influence on the development of the fuel and power complex of the nation, in providing over 90 percent of the total increase in fuel output. As can be seen from Table 2, in terms of oil Siberia has not only provided the entire increase but has also compensated for the decline in output in other regions of the nation by approximately 52 million tons. In accord with the decisions of the 25th CPSU Congress, accelerated development has been under way in non-ferrous metallurgy, the chemical and pulp and paper industries.

However, the general course of the faster growth of Siberia has not been carried out with sufficient consistency and with significant deviations from the quotas of the long-range plans. In particular, over a period of several five-year plans the quotas have not been fulfilled for the growth of gross industrial product (see Table 3), and as a result of this, Siberia's proportional amount in Soviet industry has increased comparatively slowly.

Table 3

Planned and Actual Increase in Gross Industrial Product in
the USSR and Siberia, in %

	1959-1965		1966-1970		1971-1975	
	control figures	actual	control figures	actual	plan	actual
USSR	180	184	150	150	147	143
Siberia	250	185	166	157	163	149

The existing sectorial structure of the region's industry reflects its specific role in the national territorial division of labor as a major producer and supplier of fuel, mineral raw materials, nonferrous metals, lumber and wood-processing products and a number of energy-intensive chemicals. The proportional amount of the extracting industry in Siberia is almost 2.5 fold higher than the average for the USSR. But the industrial sectors which produce the basic part of the end product (machine building, the light and food industries) and which are characterized by a relatively higher labor intensiveness, have a substantially smaller proportional amount than in Soviet industry. The particular features of the sectorial structure at the given stage basically conform to economic effectiveness from the national viewpoint (considering the shortage of existing labor resources and resources for capital investments for completing the "upper" levels of the regional production complex). But the economic advantages of developing a number of types of production in Siberia are still far from fully realized. This applies primarily to the integrated use of natural raw materials (oil, gas, nonferrous metal ores, lumber and so forth) and the production of energy intensive products in ferrous and nonferrous metallurgy and the chemical and petrochemical industries.

Share of Siberia's Resources in the Economic Potential of the Nation at the Start of the 10th Five-Year Plan in %

Coal, oil and gas resources	~75
Hydropower resources	+50
Commercial lumber	+50
Water resources	+50
Land resources	20
Fixed productive capital	10
Labor resources	~8

The machine building enterprises which exist in Siberia are little specialized for satisfying the needs of the basic sectors of the region's economy, particularly for machinery and equipment adapted for operation under local conditions. Over 70 percent of the total produced machine building product is shipped out to other regions. Among this portion are products which are generally needed for the efficient development of Siberia's natural resources. For example, the Novosibirsk Sibelektroterm [Siberian Thermoelectric] Association supplies its equipment to enterprises being built in energy

scarce regions in the European USSR, as few enterprises are being built in Siberia with electrical production processes regardless of the economic effectiveness of this.

Siberia provides approximately 8 percent of the gross agricultural product of the USSR, and this corresponds to its share in the size of the population. During the 9th Five-Year Plan, about 12 percent of all cereals, 8.2 percent of the potatoes, 8.6 percent of the meat, 9.5 percent of the milk and 11.5 percent of the wool were produced here. The per capita production of these agricultural products exceeds the national average, particularly for grain and wool. However, the achieved levels of agricultural production do not meet the established rational standards for the consumption of foodstuffs (with the exception of bread products and potatoes). Particularly noticeable is the lag behind the per capita national average production and behind the rational consumption standard for vegetables, although for a majority of the types of vegetables (with the exception of warmth-loving ones) Siberia has favorable conditions for growing them. The demand for fruits is almost fully met by imports.

As is known, Siberia is considered among the regions of accelerated development and economic growth for new territories. As a consequence of this, the proportional amount of capital construction in the gross social product here is 1.5 fold higher than the USSR average. The trend for a gradual increase in that share of capital investments which goes for the needs of Siberia has been apparent at least since the 7th Five-Year Plan. In 1975, 13.2 percent of the national volume of construction and installation work was carried out here, and 12 percent of the total capital investments were used. Nevertheless, the construction base is a bottleneck in the economic complex of the Siberian region, and this tells particularly on the development of the production and social infrastructure. The lag in transport facilities, utilities, housing construction and other elements of the infrastructure holds up the economic development of the region and reduces the rate and effectiveness of economic development in the new territories.

Over the vast expanses of Siberia, transportation plays an exceptionally important role both in the economic development and maintaining of the normal course of the production and consumption processes within the region as well as in ensuring the regular ties of Siberia with the other regions of the nation. Siberian transport handles a significant part of the shipments of such bulk freight as coal, oil and natural gas, ores and metals, building materials, lumber and grain products. But in terms of the coverage of the territory with a transport network, Siberia is several fold behind the national average. The achieved level of freight traffic on several trunks (in particular the lines connecting Western Siberia with the Urals) has already gone beyond the economically advisable limit. The volume of unshipped freight is rising and the time required to deliver the freight to the final destinations has become longer. Regardless of the significant development of railroad construction (the BAM [Baykal-Amur Mainline], the Tyumen'--Surgut--Nizhnevartovsk, Surgut--Urengoy and other lines) and the construction of a network of large-diameter oil and gaslines, transportation is one of the severest bottlenecks in the economic complex of Siberia.

The influence of the Siberian economy on the development of the national economy is determined primarily by the fact that Siberia satisfies an ever growing part of the national demand for fuel, nonferrous metals, lumber products and chemicals. Of particular importance are the deliveries from Siberia to the regions of the European USSR and Urals which lack energy resources and no longer possess sufficient reserves of many types of minerals. Over the last 10-15 years, shipments of fuel from Western Siberia have increased particularly. There has also been a rise in the shipments of diverse industrial products, grain, meat and dairy products. Along with this Siberia ships in a significant quantity of products from machine building, light, food and other industrial sectors as well as agricultural goods (primarily vegetables and fruits). This eliminates the need to organize Siberian production of many types of product which can be more efficiently produced in other regions, and makes it possible to concentrate the material, labor and financial resources on developing the sectors involved in national specialization.

The Effectiveness of the Siberian Economic Complex

In order to obtain a sufficiently objective reply to the answer of how efficient is the Siberia economy, it is essential to examine the mechanism for the functioning of the economy in the given region as part of the unified national economic complex. For this purpose use was made of a special inter-regional model of the USSR national economy and with which different variations of Siberia's economic ties with the remaining territory of the nation were analyzed. It was established that the incorporation of Siberia into the national territorial division of labor increases the end efficiency of the national economy (as expressed in the volume of national income or the fund of the nonproduction consumption of the population) by 25-30 percent, that is, the contribution of Siberia to the amount of end national economic effect is 2.5-3 fold greater than its immediate share in gross social product, national income and the nation's consumption fund (as measured in current prices). While probably requiring subsequent adjustment, this result, in

our view, is of fundamental importance for understanding the real national economic efficiency of the present-day economic complex in Siberia.

However, among managers and economists there is the rather widely held viewpoint that the movement of the productive forces to the East inevitably requires increased expenditures with a slower repayment rate, and for this reason leads to a decline in the overall efficiency of the national economy. Thus, a contradiction arises between the need to develop the eastern regions and the task of increasing national economic efficiency.

Proportional Amount of Siberia in
USSR Economy at Start of 10th
Five-Year Plan, %

Territory	9
Population	8
Social product	9
Industrial product	9
Agricultural product	8
Capital investments	12
Freight turnover	17

It is essential to investigate just how accurate this viewpoint is.

The very rich fuel-energy, mineral raw material, forest, water and land resources of Siberia make it possible in this region to carry out extensive mining and processing of diverse raw materials which in terms of their technical and economic indicators substantially surpass analogous production in the European USSR. The high concen-

tration and a combination of reserves of diverse natural raw materials make it easier to set up particularly large enterprises in Siberia and to use the most efficient forms of the territorial organization of the economy (territorial production complexes and industrial centers). This provides an opportunity to obtain an additional effect from the concentration and consolidation of production.

However, there is also a series of negative factors which impede the economic development of Siberia and reduce the potential effectiveness of this development. Among such factors we would put first of all: 1) insufficient labor resources in comparison with other regions of the nation; 2) increased cost of reproducing the labor force and the more difficult living conditions in a number of the northern territories (the need for higher wages, the higher cost of the "standard budget," the increased expenditures on the socio-domestic infrastructure and so forth for providing an equal standard of living for the population in comparison with the other regions of the nation which have better natural and geographic conditions); 3) the need for large capital investments during the initial development of the territory (into the common regional production and social infrastructure); 4) the increased cost of production due to difficult natural and climatic conditions on a significant part of the territory (particularly in construction and agriculture); 5) remoteness from the most developed economic and cultural centers of the nation (this causes increased expenditures on transporting the means of production and finished products, as well as the moving of the population, the creation of a service system, and so forth).

The designated positive and negative conditions in Siberia's development have a differing impact on the economic development of the various sectors and types of production.

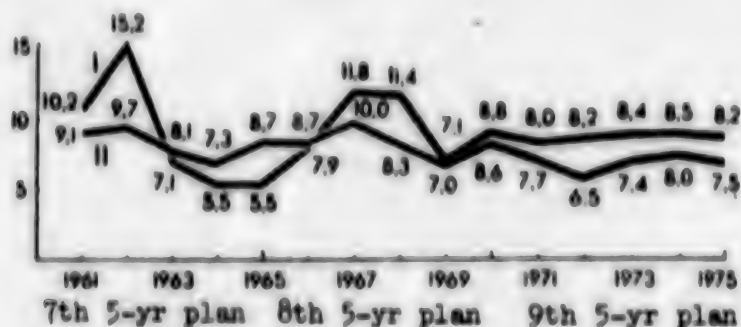
Thus, the output in Siberia of oil, natural gas, coal and nonferrous metal ores and the production of a number of energy intensive products from ferrous and nonferrous metallurgy, the chemical industry, lumber and so forth, as a rule, have no competition in the other regions of the USSR both in terms of the direct expenditures on production as well as due to the impossibility anywhere else but in Siberia of organizing the corresponding production on the required scale. The production of grain, meat, milk, eggs and potatoes is cheaper (in comparison with the national averages) as well in Siberia. Here it must be pointed out that the negative factors of economic activities are characteristic mainly in the northern zone of Siberia where basically there is only the extraction of unique and highly efficient resources (oil, gas and nonferrous metals), while the objective conditions in the southern zone of Siberia, where there is a real opportunity to locate many diverse types of production, approach the conditions in the economically developed regions of the European USSR.

The oil and gas complex in Western Siberia is an example of exceptionally high economic efficiency. According to the estimate of Academician A. G. Aganbegyan, here over the 10th Five-Year Plan, 1.7 billion tons of hydrocarbons (calculated in terms of oil) will be removed from the ground. Considering the prices on the world market (averaging over 100 foreign exchange rubles according to the official rate per ton of oil at the end of 1979), as well as the effectiveness of using the hydrocarbons within the nation, the overall effect of output will be at least 150 billion rubles over the five-year plan (considering the increase in world prices, the effect should also increase). Hence, regardless of the exceptionally high capital investments into the development of the Western Siberian oil and gas complex (about 25 billion rubles over the 10th Five-Year Plan), their economic effectiveness is several fold higher than the national average.²

It must be admitted that under present day conditions, the relative effectiveness of developing production in Siberia declines as one moves from the primary sectors (the extraction of natural raw materials) to the sectors which produce a transportable product for end consumption and require high outlays of live labor. The creation of an efficient production complex in Siberia presupposes: the development of the extraction and transporting of the natural resources to levels needed to meet the needs of the nation and the foreign market; the development of production for national specialization in the area of processing the natural raw materials such as electric power, metallurgy, the chemical, wood-processing, pulp-paper industries and so forth; finally the development of the complementary supply production which

² A. G. Aganbegyan, "Economic Problems of Siberia's Development," *EKONOMIKA I MATEMATICHESKIYE METODY*, Vol XV, No 5, p 844.

can meet the needs of the sectors of national specialization and the region's population (machine building, construction and the building industry, transportation, a food complex, the production of certain types of consumer goods, and a service sphere).



Increase Rates in the Gross Industrial Product of the USSR (II) and Siberia (I) in 1967 Prices, %

If one turns to the synthetic [analytical] economic indicators, one discovers that even now the efficiency of Siberia's production complex as a whole is no lower than the national average, while the efficiency of using live labor is substantially higher. According to the calculations of the IEIOPP of the Siberian Division of the USSR Academy of Sciences, labor productivity (in terms of produced national income) in 1975 here was almost 1.2 fold higher than the national average. The return on the fixed productive capital as a whole for Siberia is below the national average, but to a significant degree this is explained by the fact that in the sectorial structure of Siberia's production complex, a relatively large proportional amount is made up of the particularly capital-intensive sectors (extracting industry, electric power and transportation), as well as by (in part) the higher cost estimate of the capital and the need for a higher capital-to-labor ratio for the purposes of saving scarce manpower.

The more rapid growth rate of the Siberian economy over the last 10-15 years has been achieved as a whole with a more efficient use of resources than as an average for the USSR. A number of its qualitative characteristics have markedly improved. While in 1965, per capita production of national income (net product) in Siberia was approximately 10 percent lower than the national average, in 1975, for this indicator Siberia surpassed the national average by 16 percent. Overall material intensiveness in the given region has declined somewhat over the last 10 years, that is, it has changed in the opposite direction to the national trend. This is due primarily to the rapid development of the less material-intensive sectors. The Siberian economy has comparatively poorer indicators for the use of the fixed productive capital. Over the 15 years the capital intensiveness of Siberian industry has risen by almost one-third (by 24 percent as an average for the USSR). As we have already said, this is largely explained by the accelerated growth of the most capital-intensive sectors.

In analyzing the indicators for comparative production efficiency in Siberia, it is essential to bear in mind that the calculations made on the basis of current prices do not provide a sufficiently objective picture. The advantages of developing many types of production in Siberia involving the use of natural resources are not reflected in the expenditure calculations and in the wholesale prices which do not include rent rates for scarce natural resources. An analysis of the system of current wholesale prices using mathematical economics models and a comparison of domestic prices with world market prices make it possible to conclude that the prices set in the USSR for the products of the extracting sectors of industry and agriculture are substantially understated, while those for the products of a number of manufacturing industry sectors, on the contrary, are relatively overstated. As a result, the proportional amount of Siberia is artificially understated in the indicators of national income and the gross social product of the nation, while the final indicators for the efficiency of the regional complex are worsened.

Table 4

Production Efficiency in Siberia (in % of the USSR Indicators)*

Indicators	Current prices	Optimum prices
Per capita production of national income	116	135-145
Social labor productivity	119	145-155
Return on investment in industry:		
with actual sectorial structure	76	95-105
with comparable sectorial structure	95	115-125

* According to calculations of IEIOPP of the Siberian Division of the USSR Academy of Sciences.

At present a substantial gap has developed between world and domestic prices for oil, natural gas and many products of oil refining and petrochemistry, nonferrous metallurgy, and the lumber and wood-processing industry. If the basic product types of Siberia and the USSR are recalculated in world prices (including those for which the domestic prices are relatively higher than the world ones), then the indicator for the relative amount of the region in the production of USSR gross product and national income would increase by a minimum to 10-13 percent. Correspondingly the indicators for labor productivity and the return on investment as well as the growth rate of social product, national income and gross industrial product of Siberia would rise by 20-30 percent. Recalculations of the production volume, labor productivity and return on investment in optimum product evaluations calculated using the optimization intersectorial interregional model would lead to approximately the same results (see Table 4).

The efficiency of a regional economy can be judged not only on the basis of an interregional comparison of expenditures on product output, but also from the results of interregional economic exchange.

According to our calculations, in 1975, the total inflow of product into Siberia exceeded the total outflow by approximately 3 billion rubles (according to the domestic prices for the end consumption). Here the question may arise: is not the negative inflow-outflow balance proof that the national economy is investing more into the Siberian economy than it is receiving back and as a consequence of this (at least at the present stage) is lessening its development possibilities? If this is the case, then the pressing economic necessity and effectiveness of rapid development for Siberia's productive forces is placed in doubt.

In our opinion, the reply to the given question must be approached from two positions.

In the first place, it must be stressed that the balance of exchange does not directly characterize the influence of the economy in an individual region on the development of the national economy as a whole, and is merely one of the indirect characteristics. There must be a more profound examination of the mechanism for the functioning (interaction) of a region's economy as part of the national economic complex. Secondly, one must critically view the results of calculations based on current prices. Above it was already pointed out that current prices artificially understate the actual contribution of Siberia to the national economy. According to the data of R. I. Shniper, a recalculation of Siberia's inflow and outflow in world market prices would lead to a positive balance of 8-9 billion rubles. The amount of the balance of Siberia's interregional exchange would change in the same direction if use were made of the optimum product estimates obtained from the optimization interregional model.³ Thus, in improving the methods of value measurements, the amount of Siberia's inflow-outflow balance also shows the active role of the given region in Soviet economic development.

On the Development Prospects of Siberia as Part of the National Economic Complex

The coming stage of socioeconomic development in the USSR is characterized by a number of particular features which will have a substantial influence on the choice of the strategy for Siberia's development. These include: the

³ The forecast calculation using the model produced the following results: in current prices, Siberia's balance in 1975 equalled -3.6 billion rubles, and in optimum product estimates +2.9 billion rubles (See A. G. Granberg, "Optimizatsiya Territorial'nykh Proportsiy Narodnogo Khozyaystva" [Optimization of Territorial National Economic Proportions], Moscow, 1973, p 177).

expected decline in the growth rate of the population and labor resources; the noted trend for a decline in the growth rate of capital investments; the more difficult situation in supplying the European zone of the nation with natural resources; the rapid development of foreign economic ties.

The problems of supplying the Siberian economy with labor resources over the immediate future is exacerbated not only by the sharp reduction in the natural increase of the working-age population (by 3-4 fold), but also due to the danger of migration of the population into those regions of the country which are moving into the group of labor-scarce ones. It must be considered that during the three previous five-year plans (1961-1975), when the labor resources situation was better in the European regions of the USSR, Siberia still lost over 1 million persons as a result of migration. In recent years this trend has been overcome by a number of measures in providing better living conditions for Siberia's population, however, this occurred during a period of relatively high increase rates in the working-age population. Now this period has ended.

Undoubtedly, the main way for solving the problem of a manpower supply for the Siberian economy is an accelerated (in comparison with other regions) rise in labor productivity and the carrying out of a consistent labor-saving policy in all the economic sectors. For retaining local personnel and attracting additional labor resources to Siberia, it is essential to meet two conditions as a minimum: grant priority to the Siberian population in raising the standard of living; more rigid control of vacant jobs and the thrifty use of labor resources in the western and southern regions of the USSR. These directions of socioeconomic policy are of a state-wide nature and do not come down merely to the problems to be solved for Siberia.

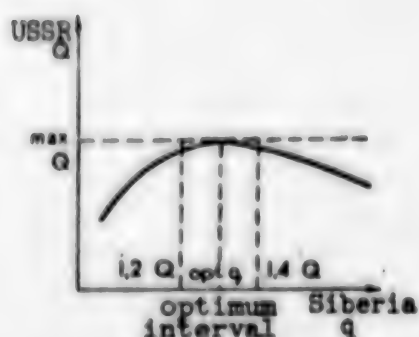


Fig. 1. Interdependence of Average Annual Increase Rates of Production for Siberia (q) and the USSR (Q)

tensive sectors of national specialization (fuel, metallurgical, chemical and lumber), and overcoming the backwardness of the production and socio-domestic infrastructure. But with a drop in the growth rate (and even more the absolute volume) of capital investments as a whole for the nation, a

Beginning with the end of the 9th Five-Year Plan, in the Soviet economy a trend has appeared for a drop in the growth rate of capital investments. The annual average growth rate of capital investments which in 1966-1976 was 7.3 percent will decline to 4.4 percent in the 10th Five-Year Plan. If this process continues, then the problem of the accelerated development of the productive forces in Siberia will be seriously complicated. The need of Siberia's economy for capital investments is objectively growing. This is related to the need to rapidly develop the capital in-

significant rise in the proportional amount of capital investments being channeled into Siberia can lead to their absolute decline in other regions, primarily in the European zone of the country. This, in turn, creates a real countertrend to the accelerated growth of the productive forces in the eastern regions of the nation. The approaching situation requires immediate measures to intensify the use of capital investments in the economically developed regions, to save capital investments in regions of new development through efficient forms of the territorial organization of production (the creation of territorial production complexes and industrial centers), and so forth.

Over the long run, for a number of regions, particularly in the European part, the opportunities to expand local resources of fuel, energy and raw materials will be depleted. Due to the transition to poorer deposits and to a worsening of mining conditions, as a rule, expenditures will increase for the production of a majority of types of mineral resources. In this situation the economic role of Siberia will increase both due to the advantages in the technical and economic indicators, as well as in many instances due to the absence of other alternatives for the national economy.

It must be expected that the rate of foreign trade in the USSR will obviously outstrip the growth rate of production. The USSR will take an ever more active part in the system of the international division of labor and primarily by deepening socialist economic integration. Here a significant part of the foreign exchange earnings will come from oil and oil products, gas, coal, nonferrous metals and lumber, that is, precisely those types of products the proportional production of which is to increase in Siberia. The dynamics of world market prices help to increase the economic effectiveness of Siberian exports.

We have carried out research on the possible development rates and proportions for the Siberian economy using an optimization interregional model. This model makes it possible to calculate and intercompare balanced variations for national economic development in a territorial breakdown over a long-range period. The variations of the planning decisions are chosen in terms of the national economic optimality criterion, that is, maximizing the level of satisfying society's demand or the minimizing of social expenditures.

The main aim of the conducted research was not an attempt to obtain a precise and uniform forecast of the future, but rather to disclose the constant development patterns in the Siberian economy depending upon the trends in the national economy. Several score variations were calculated for the development of the USSR national economy broken down for the major regions. Here we examined various hypotheses on the dynamics of labor productivity, the growth of capital investments and capital intensiveness, the effective use of material resources, and so forth.

As a result of the simulated development of the USSR national economy under the changing conditions, the following dynamic pattern was disclosed: the

annual average increase rate for the production of national income in Siberia should be 1.2-1.4 fold higher than the national average (the ratio of the growth rates for gross product should be approximately the same). The designated lead is an optimum one, that is, it corresponds to the maximally achievable level of satisfying the national demand. Here an additional circumstance should be made clear: a deviation from the optimum amount of the growth rate for the Siberian economy (to either side) will lead to different consequences. With a rise in it above the optimum value, the national rate will decline insignificantly, but with a decline of the increase rate for the Siberian economy below the optimum, the curve of the national rate drops more precipitously (see Fig. 1).

Such a reaction in the national economy to a change in the development rate of Siberia is characteristic for the mechanism of interregional economic interactions in the USSR. A decline in the increase rate for the production of national income or gross product in Siberia, due to the circumstances of its sectorial structure, almost immediately is reflected in the scale of development for the sectors of national specialization. But since a drop in the production volumes of these sectors in Siberia cannot be fully compensated for by an increase in production outside it, ultimately this leads to a substantial drop in the growth rate of the national economy.

The share of Siberia in national production (in terms of social product, national income and gross industrial product) by 1990 can increase by approximately 2-3 percentage points, that is, reach 11-13 percent.⁴ An essential condition for this is an increase in the share of Siberia in the national capital investments to 15-16 percent.

The national specialization of the Siberian region should be strengthened over the long run. Metallurgy, electric power, the fuel, chemical and lumber industries, the building materials industry and construction should be developed effectively and at rates surpassing the national averages. Here the growth rates for production are strongly differentiated in the sectors. With a uniform growth for a majority of the sectors, it would be impossible to develop the sectors of national specialization on the necessary scale, primarily due to the shortage of labor resources.

It is not advisable to develop a number of sectors in Siberia at such high rates. These include machine building as a whole and light industry as the most labor-intensive sectors. However, individual subsectors of machine building and light industry which are aimed primarily at satisfying local demand and which control the employment structure in certain regions have favorable conditions for their development.

⁴ N. N. Nekrasov, "The General Plan and Life," EKO [this journal], No 4, 1979.

In studying Siberia's development prospects, it is fundamentally wrong to limit oneself to analyzing a single optimum variation. The region's economy is very elastic in terms of the development factors and conditions for the national economy. Over the long run, this particular feature will be intensified due to two factors: in the first place, Siberia will be responsible for virtually all the increase in the production of fuel, many nonferrous metals, labor-intensive chemicals and lumber products, and for this reason it should almost fully compensate for the fluctuations in the national demand for these types of product. Secondly, due to the scarcity of labor resources, fluctuations in the development levels of the specialized sectors can lead to sharp changes in the development levels of the supply and complementary types of production (such as machine building, light and in part the food industry).

**The Share of Siberia in the National Production of the Basic
Types of Industrial Products at the Start of the 10th
Five-Year Plan, in % of Total**

Coal	29	Steel	8
Oil.	40	Tractors	7
Gas.	20	Machine tools.	2
Electric power	16	Fertilizers	3
Timber felling	26	Paper	3
Lumber	23	Furniture	6
Plastics & resins.	13	Textiles.	3
Chemical fibers.	11	Footwear.	4
Cement	10	Meat	8
Oils, fats	10		

For this reason, it is essential to work out scenarios for the possible development of the Siberian economy and which would correspond to the basic situations that could arise in the future but where their feasibility cannot be uniformly foreseen.

We examined five basic scenarios for the development of Siberia in the national economic complex. These were oriented at studying a certain problem and were drawn up by generalizing the variation calculations in which provision was made for the following changes: the effective use of fuel, raw products and materials; the growth rates of labor productivity and the size of the labor resources by attracting additional manpower to Siberia; the national capital investment resources; Siberia's share in the national fund of nonproduction consumption and nonproduction accumulation; the situation in the transport support for the economic ties between the eastern and western regions of the nation.

Let us focus attention on certain results which involve the consequences of changes in the efficiency of production factors.

A rise in labor productivity leads naturally to the growth of national income and the national consumption fund. But since Siberia is the most labor scarce region (in this regard it competes only with the Far East), a rise in labor productivity here leads to a greater economic effect, and the gap in the growth rates for produced national income in Siberia and the USSR increases in Siberia's favor.

A rise in the efficient use of material resources does not lead to a weakening of Siberia's position in the national economy. This process may somewhat reduce the advisable development rates in Siberia for the raw material sectors (due to the higher export needs, this reduction cannot be significant), but at the same time this will encourage this region to produce more completely processed fuel and raw materials (by releasing the labor resources from the extracting sectors).

The Siberian economy will respond to a higher efficiency of capital investments by an acceleration in the rate of its development (particularly national income; gross product increases insignificantly). Here there will be a substantial reorganization of the sectorial structure, and this is basically explained by the following factors. In the first place, a drop in the proportional capital expenditures reduces the demand for the amount of construction work as well as for the means of production used to support the investment process (the building materials industry, metallurgy and electric power). Secondly, as a result of the decline in the designated demand and the production volume in the corresponding sectors, in Siberia labor resources are released and these are channeled into the complementary sectors of the regional complex. The figures for the variations with changing capital investment volumes affirm the economic advisability of a more rapid growth of the capital investments into the Siberian economy and the high effectiveness of the measures to reduce capital expenditures. It must also be pointed out that the national economic effect from the allocated capital investments increases greatly in simultaneously carrying out a labor-saving policy (including increasing the capital-to-labor ratio) and measures to save material resources.

The calculations made lead one to the conclusion that the accelerated development of Siberia is a permanent pattern for the optimum development of the Soviet national economy over the foreseeable future. However, one cannot merely hope that this pattern will be realized automatically. A comprehensive program must be worked out and implemented for the development of the productive forces in Siberia, a program aimed at solving the major economic, social and scientific-technical problems.

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REGIONAL DEVELOPMENT

ACADEMICIAN MARCHUK DISCUSSES SIBERIA'S FUTURE

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 3, Mar 80 pp 3-14

[Interview with Academician G. I. Marchuk, deputy chairman of the USSR Council of Ministers and the chairman of the USSR State Committee for Science and Technology, conducted by N. Pritvits: "Siberia Looks at the Future"]

[Text] The Presidium of the USSR Academy of Science adopted the suggestion of the Siberian Department of the academy to hold, in June 1980, in Novosibirsk, an all-union conference on the development of production forces in Siberia. A forum on this level--the sixth in the history of the science of Siberia--counting from the first scientific research congress held in 1926, will also be one of the biggest.

The purpose of the conference will be to earmark ways for the implementation of directive decisions taken in recent years on the priority development of the eastern parts of the country and the recommendations expressed by Comrade L. I. Brezhnev during his trip to Siberia and the Far East.

Undertaking the publication of materials on the conference, the purpose of the journal is to draw the attention of the public to the key problems of interregional and intersectorial nature, and inspire interested organizations and the readership at large to join the work of the conference and submit their suggestions and wishes.

We begin with the publication of an interview with Academician G. I. Marchuk, chairman of the USSR Academy of Sciences Siberian Department.

EKO: What has motivated the holding of all-union conference on the development of production forces in Siberia in 1980? What will be its main purpose?

[Answer:] The conference will discuss strategic problems of the development of Siberia over the next five years and for a longer period, through the years 1990-2000. It will be held in an exceptionally important turning point, when the state planning organs are formulating the basic directions for the country's economic and social development through 1990 and the 11th Five-Year Plan.

The CC CPSU and USSR Council of Ministers decree "On Improving Planning and Intensifying the Influence of the Economic Mechanism on Upgrading Production Effectiveness and Work Quality" inaugurates a new stage in improving planned economic management. It is a question, in particular, of properly defining priorities in the development of sectors and economic rayons in order to insure progressive changes in the national economic proportions and upgrade public production effectiveness. In this connection, it is of exceptional importance to comprehensively formulate the role of Siberia in the country's economy today and the growth of this role in the future, on the sectorial and territorial levels.



Academician G. I. Marchuk

According to the comprehensive assessment of economists from the Siberian Department, based on economic-mathematical computations, the pace of

development of the Siberian economy should exceed the national average by factors of 1.2-1.4. Should Siberia fail to develop at the required faster pace, the result would be a slowdown in the development of the country's economy as a whole, above all because of shortages of raw materials and fuel and energy resources. Should Siberian development exceed the optimum figures, the development of the national economy will also be reduced somewhat as a result of the partial "freezing" of capacities.

The elaboration of profoundly substantiated scientific recommendations for the development of Siberian production forces, so that the rates and proportions of this development be directed toward achieving the highest possible national economic results, will be the main direction in the work of the conference.

EKO: What are the specific tasks of the conference?

[Answer:] The main purpose is the all-round discussion of the basic report on the economic and social problems of Siberian development, drafted by the USSR Academy of Sciences Siberian Department, on the assignment of the central party and soviet organizations.

This report is the result of collective thinking. It is based on the results of long studies conducted by several tens of institutes of the USSR Academy of Sciences Siberian Department, VASKhNIL [All-Union Academy of Agricultural Sciences imeni Lenin] and the Academy of Medical Sciences, and materials supplied by local organizations, planning organs, ministries and departments. It contains a study and earmarks the prospects for the development of the most important intersectorial and sectorial complexes in Siberia: fuel-energy, metallurgical, chemical, machine building, transportation, timber, construction and others. Particular attention has been paid to the scientific formulation of the biggest regional and interregional programs for Siberia which will have the greatest impact on the development of the country's production forces through the year 2000.

The conference will draft recommendations aimed at upgrading the economic effectiveness of the development of the Siberian economy on the basis of the comprehensive utilization of Siberia's natural resources and improvements in the living conditions of the Siberian population.

The second problem which will be considered at the conference is that of the basic directions for scientific research and geological survey, planning-research and experimental-industrial projects related to the further study of Siberian resources and economic potential. Gradually, the comprehensive scientific program entitled "Siberia" will become the pivot of these studies. For this reason, a thorough discussion will be held of the results and work plans based on this program. The conference will provide an impetus, a direction for the work not only of the institutes of the three Siberian academies, but the sectorial and planning and research organizations as well.

The third problem is directly related to the July 1979 CC CPSU and USSR Council of Ministers decree. The conference will consider problems of improving all aspects of management applicable to Siberia's economic and social development. Particular attention will be paid to managing the development and activities of Siberian regional-production complexes.

EKO: You mentioned the increased role of Siberia in the country's economy. We would like more details on this subject: What sectors or areas do you have in mind, above all? How will this affect the work of the conference?

[Answer:] Clearly, it would be more accurate to speak not of individual sectors or regions, but above all of big national economy complexes and target programs implemented or formulated on Siberia territory.

Today, insuring the faster production of fuel and energy is the most important task. Here the main role goes to Siberia, which accounts for three-quarters of all mineral fuel-energy resources.

Already now one out of every two tons of petroleum and one out of three cubic meters of natural gas extracted in the country come from Siberia. According to geologists and economists, the share of Siberian petroleum and natural gas will continue to increase at least until the end of the century. For this reason, the biggest national economic program is the creation and development of the West Siberian Petroleum and Gas Complex. A new stage has been initiated currently in its development. It is related to the increased role of natural gas, its increased extraction and utilization and the development within the complex of a large-scale petrochemical industry.

Eastern Siberia will become the next petroleum and gas extraction base in the country. Petroleum and natural gas have already been extracted in Krasnoyarskiy Kray, Irkutskaya Oblast and Yakutiya, and deposits characteristic of a large-scale petroleum and gas bearing area have been discovered.

Petrochemistry will be developed in Siberia at a high pace. A very high capacity combine is under construction in Tobol'sk; the Tomsk Chemical Combine and the Achinsk Petroleum Refinery will be commissioned soon. The Omsk and Angarsk petrochemical complexes will be expanded.

Coal is the second Siberian energy program. The development of the Kansk-Achinsk lignite basin was undertaken this five-year plan. Here open strip mining of unique productivity will be developed and thermoelectric power plants of unparalleled unit capacity will be built. One of the biggest centers for power-intensive outputs may be created in the area of the Kansk-Achinsk Fuel-Energy Complex (KATEK).

New life will be given to the Kuznetsk coal basin. Initially, it was assumed that the Kuzbass coal will meet essentially metallurgical requirements. The latest assessments of geologists and economists show that reserves of high-caloric Kuzbass coal have turned out to be considerable higher than was believed; variants for the further inclusion in the country's energy balance are being formulated.

Siberia has already proved to be the biggest hydraulic power area in the world. The Irkutsk, Bratsk, Ust'-Ilim and Krasnoyarsk hydroelectric power plants and the Sayansk Hydroelectric Power Plant under construction are drawing to themselves, like magnets, industrial sectors. They have become pivots in the development of territorial-production complexes in the Angara-Yenisey area. The construction of the Boguchanskaya Hydroelectric Power Plant will provide an impetus for development along the lower reaches of the Angara. The Sredne-Yeniseyskaya and Osinovskaya GES [hydroelectric power plants], a hydroelectric power plant on the Podkamennaya Tunguska and possibly the Turukhanskaya GES on the Nizhnyaya Tunguska, perhaps the

biggest in the world, are on the agenda. The Khantayskaya GES is effectively operating and the Kureyskaya GES is under construction in the Extreme North.

The development of the power industry led to the shaping of a powerful national economic complex in the Angara-Yenisey area. It is here that the main base of the country's aluminum industry is concentrated (giants such as the Bratsk and Krasnoyarsk aluminum plants and the Sayansk plant under construction); highly effective chemical complexes have been built. The biggest among them are those Angarsk and Ussol'ye. Combined with inexpensive power, the timber resources are a base for the development of timber processing and cellulose production. In the future this area will become a galaxy of power-industrial complexes and a center of electrometallurgy, electrochemistry and other energy-intensive production.

The program for the building of the BAM [Baykal-Amur Main Line] and the development of industry in the areas adjacent to the main line is one of the priority state programs. It is a question of developing a new industrial belt in our country in the central part of Eastern Siberia and the Far East. This area will enrich the country's national economy with coal, timber, iron ore, nonferrous metals and raw material for the production of aluminum and chemical fertilizers. Enterprises of the mining, power, metallurgical, timber-chemical and other industries will be built here.

Big territorial-production complexes will be built in the BAM area, each of them based on the natural resources of the corresponding region. Suffice it to name the Yuzhno-Yakutskiy coal basin, the Udokanskoye copper deposits, the timber resources in the northern part of Irkutskaya Oblast and Khabarovskiy Kray and the one-of-a-kind Synnyrskiy Massif of ores containing potassium and aluminum. As to nonferrous metallurgy, the importance of the Noril'sk Ore Mining-Metallurgical Combine, within which the new Nadezhdinskiy Metallurgical Plant is already in operation, will increase even further.

The list of growing industrial giants and new construction projects in Siberia could be extended for more. Extremely rich natural resources combined with as yet undeveloped territories are a guarantee for the faster development of the eastern areas of the country. This will make possible the extensive extraction and processing of local raw materials, and the development of power-intensive and water-intensive production facilities which will be substantially superior to similar production facilities in other parts of the country in terms of their technical and economic indicators.

Such indicators could be increased even further if the dynamic development of industry can be fully secured by the construction industry, powerful equipment produced in Siberia and the availability of all the required types of transportation. To this day we are experiencing severe losses because of the unadapted nature of the equipment to the northern conditions. No less important is a consideration of the other characteristics

of Siberia related to its geological structure and high concentration of natural resources, which make the use of particularly powerful one-of-a-kind equipment most effective.

Turning to global problems such as environmental protection, here again the role of Siberia with its huge undeveloped areas is rising with every passing year. With the aggravation of the water shortage the importance of Lake Baykal, the greatest reservoir of most pure fresh water on our planet, and of the powerful Siberian rivers, rises. The condition of the earth's biosphere and the stability of the climate, as well as the creation of conditions for stable and high farm yields, greatly depend on the efficient utilization and reproduction of Siberian timber and water resources.

All this leads to the conviction that the solution of new, large-scale problems related to the economic development of Siberian areas will demand the drafting of long-term balanced programs and their profound scientific substantiation. A number of complex problems arise here which require the coordinated efforts of scientists in all fields, designers, planners and researchers.

The conference will discuss problems of the fuel and energy complex, of key importance to our economy, the use of mineral-raw material resources, the petroleum and gas complex and coal industry, and the development of machine building, ferrous and nonferrous metallurgy, the chemical and timber industry, agriculture, capital construction and the transportation system. Particular attention will be paid to the prospects and foundations for the development of territorial-production complexes, and to regional, inter-regional and social programs.

The work of the conference will be conducted by sectorial and intersectorial sections; the main reports and discussions of comprehensive problems will take place at the plenary meetings.

The conference will be attended by leading scientists and representatives of the planning organs, sectors, party and soviet organizations of oblasts, krays and autonomous republics in Siberia, and of big enterprises and associations.

EKO: So far we have discussed primarily the economic and scientific and technical problems of Siberian development. Will social problems, related to the needs and interests of the Siberians themselves--the people through whose toil Siberia's industrial is being created--be discussed at the conference?

[Answer:] Unquestionably. The intensified role of social factors in the country's economic development and the increased effectiveness of social production are rising in front of our very eyes.

These problems are particularly urgent in Siberia, considering its shortage of manpower resources. The need for intensive industrial development

without the involvement of new major contingents of workers requires the use of effective technologies and the comprehensive automation of production processes. At the same time, we must insure higher living standards for the Siberian population, in order not only to keep it here but to create incentives for the attraction of specialists from other parts of the country.

For this reason it would be impossible to consider plans for the development of sectors or rayons separately from plans for social development. This represents a single complex and it is precisely this way that we are considering the discussion of all Siberian problems at the conference.

The work of several sections at the conference will deal with social aspects: the socioeconomic problems of town and country and medical-hygiene problems of Siberian development. The sections dealing with agriculture and the agro-industrial complex, and ecology and environmental protection will be directly involved with problems of Siberian living conditions.

The pace and scale of development of Siberian production forces depend on the number and quality of the specialists who will work here. The section on Siberian scientific-educational potential will consider the training of cadres for industry and science.

EXO: The USSR Academy of Sciences Siberian Department has been working on the study and development of Siberian natural resources from the very beginning of its existence. Its establishment in 1957 became one of the stages in the course toward the accelerated development of Siberia. The 1977 decree of the CPSU Central Committee on the activities of the USSR Academy of Sciences Siberian Department noted that the department "has had and is having a direct impact on the development of production forces, education and culture in the eastern parts of the country."

What characterizes the present stage of scientific work of the department in the area of Siberian problems?

[Answer:] In the past slightly more than 20 years the Siberian Department has substantially grown, both quantitatively and qualitatively. Strong scientific schools have been developed and a large number of major results have been obtained in the field of basic research and its application.

Now, when the Siberian Department is a powerful and mature scientific collective, working on the front lines of Soviet and world science, the time has come to focus the efforts, on the basis of new positions and on a broad scale, on the solution of the main problem for the sake of which it was organized. This problem is to contribute to the development of Siberian production forces.

It is precisely the high level of basic research achieved over 20 years and the acquired cadre and material-technical potential that enables us

seriously to undertake the implementation of major programs of governmental significance. They are the social order facing the scientific society of the academy.

The CC CPSU decree on the activities of the department and the suggestions expressed by Comrade L. I. Brezhnev during his trip in Siberia and the Far East, provided a powerful impulse to the intensification of this work.

In 1977-1978, aktivs met in all oblast and kray centers in Siberia, and the Yakutskaya and Buryatskaya autonomous republics. Together with the local party and soviet organizations, heads of enterprises, and the scientific public, they discussed the most topical regional development problems. This resulted in the drafting of over 30 scientific programs combined within the "Sibir'" consolidated long-term comprehensive program.

The program covers central problems related to the study and utilization of mineral, land, timber, and water resources of the eastern area, the development of extremely big national economic complexes, such as the Western Siberian Petroleum and Natural Gas Complex, Kuzbass, KATEK, Krasnoyarskiy Kray, the BAM area, Lake Baykal, the Angara-Yenisey Power Industry Complex, and other areas, as well as environmental protection and other complex problems.

A considerable share of basic and applied studies by the USSR Academy of Sciences Siberian Department, to be conducted in the 11th and 12th five-year plans, will be focused precisely on such key problems of the comprehensive utilization of Siberian natural resources and development of production forces.

The formulation of the "Sibir'" comprehensive program enabled us clearly to see the basic scientific problems whose study will back the individual complexes within the program. In turn, work on regional and comprehensive Siberian programs is steadily providing new food for theoretical research, thus insuring both the direct and inverse ties between basic science and practical requirements.

The main purpose of the program is to single out the most important problems of Siberian production forces and define the means for their solution which would insure the highest rates of economic development of the entire country.

EKO: In accordance with the "Sibir'" program, the USSR Academy of Sciences Siberian Department scientists have undertaken the solution of a large number of new complex problems. Yet, the size of the scientific collectives remains virtually the same. What forces will be used for the solution of these problems?

[Answer:] First, most of the problems within the "Sibir'" program are not new to our institutes which have been dealing with them for many years. It

is a question of considerably focusing basic and applied research and forces and facilities on the main problems facing Siberia.

Second, the steady development of science creates essentially new highly effective research methods. It is a question, above all, of the all-round automation of scientific research. The development of aerospace methods for the study of natural resources on earth offers us tremendous possibilities. The seismic charting of the subsoil and the processing of the data with precise computer methods will enable us in the near future reliably to discover mineral deposits and reduce to a minimum the amount of survey drilling.

There is another, no less important, side to this work. Naturally, the Siberian Department would never be able to answer all problems related to the comprehensive development of production forces throughout Siberia through its forces alone. Our main reserve is the unification and concentration of the efforts of Siberian scientific and production organizations, higher educational institutions, geological administrations, and sectorial and problems laboratories, regardless of their departmental affiliation. We have developed a solid base in this area. In addition to 50 institutes of the USSR Academy of Sciences Siberian Department, over 200 scientific research, design, and production institutions of other departments and higher educational institutions are already involved in work on the "Sibir" program.

Thus, traditional creative relations have been developed between the Siberian Department and the USSR Ministry of Geology. Recently they were codified with a cooperation contract focused on joint activities based on the "Sibir" program. We are working on Kuzbass and KATEK problems in close contact with the Ministry of Coal Industry. A contract for scientific and technical cooperation between the USSR Academy of Sciences Siberian Department and the Noril'sk Ore Mining and Metallurgical Combine imeni A. P. Zavenyagin has been concluded and is being successfully implemented. We are closely cooperating on the solution of a number of problems with Siberian higher educational institutions. Our closest neighbors--the institutes of the Siberian departments of VASKhNIL and the Academy of Medical Sciences--are actively working on the "Sibir" program.

The point is not only to intensify and expand scientific research. Participation in the work on the program by sectorial scientific research institutes and production organizations will accelerate the application of scientific achievements in Siberian economic practice. The involvement of VUZ teachers and students in research will make it possible, at the training stage, to involve the young people in topical Siberian problems and to graduate specialists better trained to cope with the assignments facing them.

We are working on linking Siberian programs with national programs and are cooperating with other institutes of the USSR Academy of Sciences and with

republic and sectorial academies. We hoped that the conference will represent a noteworthy step in this direction.

EKO: This is not the first conference on the development of Siberian production forces. Starting with the 1920's, the USSR Academy of Sciences, together with interested organizations, has regularly sponsored sessions and conferences to discuss basic problems and formulate strategies for research and directions of Siberia's economic development. In your view, what will be the place that the 1980 conference will assume among them?

[Answer:] The 1980 conference will take place, as I pointed out, at a turning point, when a reorganization of planning on a national scale has been undertaken, when comprehensive target programs are becoming a mandatory element in long-term planning, and when a transition to new and progressive forms of correlating interests of sectors and territories is being prepared. It is precisely this that determines the significance of the forthcoming all-union conference for the development of Siberian production forces which will draft interrelated recommendations on most important Siberian problems, in which science and practical work will be coordinated.

All of us are aware of our responsibility for the future development of Siberia. The importance of the proper scientific substantiation of development trends, in connection with increased role of Siberia in the country's national economic complex, mandates us to be on the level of such tasks.

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8 July 1980